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ABSTRACT

This collection of 10 teacher's resource guides was developed by the Cobb County Georgia Career Education Project and contains the 10 units: (1) for grade 1: The School, Careers in Public Service; and What Does My Family Do All Day?; (2) for grades 3 and 4: Commercial Airlines and Airports, Careers in Transportation; Trains, Careers in Transportation; and Music, Careers in Fine Arts and Humanities; (3) for grades 5 and 6: The Newspaper, Careers in Communications and Media; The Hospital, Careers in Health; and Television, Careers in Communications and Media; (4) for grade 6: Photography, Careers in Communication and Media; and Building Construction, Careers in Construction. All units have the same format which includes an introduction, notes to the teacher, goals, learner objectives, and concepts; subject matter; occupational information and suggested motivation, study, research, and correlating activities; participative, culminating, and followup activities; materials and equipment needs; evaluation, resource materials, and bibliography. The photography unit has four appendixes related to making a camera and developing and printing negatives. Sections on occupational information give a general description, job entry and preparation, general requirements, working conditions and benefits, and occupational listings. In some units the bibliography is divided into children's and teacher's selections. (NH)

SYNOPSIS

To accompany Career Education Units;

THE SCHOOL, Careers in Public Service

WHAT DOES MY FAMILY DO ALL DAY?

TRAINS, Careers in Transportation

MUSIC, Careers in Fine Arts and Humanities

COMMERCIAL AIRLINES AND AIRPORTS, Careers in Transportation

THE NEWSPAPER, Careers in Communications and Media

THE HOSPITAL, Careers in Health

TELEVISION, Careers in Communication and Media

PHOTOGRAPHY, Careers in Communication and Media

BUILDING CONSTRUCTION, Careers in Construction

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SYNOPSIS

This project grew out of a state grant which funded an Occupational and Career Exploration Program (O.C.E.P.) in Cobb County beginning September, 1969. The O.C.E.P. Project was to develop a model for the program in which we are now engaged. Federal funding for exemplary programs became available sooner than expected and a proposal for such funds was initiated in November, 1969, and submitted December 31, 1969, requesting $130,000.00 per year for three (3) years. The Occupational and Career Development Program was funded July 1, 1970, in the amount of $114,027.00 renewable on the first and second anniversaries.

The Project Staff consists of: Joel Smith, Project Director; Robert E. Cook and Albert Price, Elementary Career Development Specialists; David Taylor, Middle School Career Development Specialist; Farris Foresman, Secondary Career Development Specialist; Judy Comer and Anne Rudder, Curriculum Writers; Pat Carter and Deborah Starnes, Secretaries. The pilot schools within the Cobb County School System which are involved in the project are: Sprayberry High School, and its feeder school, J. J. Daniell Middle School, and its feeder schools, Bells Ferry Elementary School, Blackwell Elementary School, Elizabeth Elementary School, and Mountain View Elementary School. In 1972, one (1) teacher is also involved as a pilot teacher in each of the other thirty-four (34) elementary schools in Cobb County.

Teachers and principals in the aforementioned pilot schools were involved in all phases of planning prior to implementation. An orientation conference was held in January, 1970 to initiate pre-planning activities and teacher in-service meetings. During the course of the subsequent in-service meetings, a number of activity-centered units (resource guides) were developed by the teachers who are now implementing them. Consultants' inputs from various colleges and universities within and without this state and strategic support from the State Department of Education in all phases of this project's development are evident in the quality of the model developed.

The program is one of orientation and information at the elementary level, information and exploration at the middle school level and exploration and preparation at the secondary level -- all built around a Career Development theme which includes: (1) the student's evaluation of self-characteristics, (2) exploration of broad occupational areas, (3) introduction to the economic and social values of work, (4) introduction to phychological and sociological meaning of work, (5) explanation of educational avenues, and (6) development of the student's process of decision making based upon the foregoing items.

Analysis of the above goals led to the development of six (6) elements (components) now incorporated into all units on all grade levels. These elements are: (1) hands-on activities, (2) role playing, (3) field trips into the community, (4) resource people into the classroom, (5) subject matter tie-ins, and (6) introduction to occupations in the community that are relevant to each unit. A unit approach was chosen as a structual framework for implementing the Career Development approach. The concurrent and overlapping nature of these elements encourages individual creativity and permits flexibility within any given unit.

Staff curriculum writers, drawing upon teacher/student interests, ideas and needs,

and appropriate grade level concepts develop units on a pre-determined format. Teachers then implement such units and offer suggestions for further development or refinement. The instructional staff curriculum supervisors, representative teachers and curriculum writers working as a team will incorporate Career Development units into the overall Cobb County curriculum guide at appropriate points. This effort to present Career Development units as an integral part of the ongoing curriculum will be instrumental in the implementation of the Career Development approach system-wide.

The Career Development approach serves to: (1) give the student learning by doing (concrete to abstract) experiences, (2) point out the relationship and interdependence of the academic disciplines to one another and to various work roles in the community; and (3) give the teacher a vehicle by which she can present the existing curriculum as opposed to adding additional subject matter. At the elementary and middle school levels, there is neither intent nor desire to channel students into any occupational decision; rather the goal is to build a base of experience and exposure upon which the student can most effectively make decisions relating to his next step in the life-education continuum.

Career Development Specialists work with respective grade level teachers in selecting activity centered units, in their planning, in procuring materials and supplies, in arranging field trips, and in bringing resource persons into the classroom. The function of the Career Development Specialist is thus one of support to the implementing teacher. The teacher, in turn, incorporates Career Development activities into the ongoing curriculum, at the elementary level, largely in a self-contained classroom with major emphasis on awareness.

At the middle school level, the unit approach emphasizes exploration, drawing upon simulated work experience and increased emphasis on self awareness as applied to exploratory work situations. Seventh grade teams consisting of Math, Science, Language Arts, and Social Studies teachers, implement interlocking units with each teacher relating respective subject matter concepts and skills to the unit activities.

To give increased emphasis to the exploratory nature of the Career Development approach, a Program of Educational and Career Exploration (P.E.C.E.) is incorporated at the eighth grade level at J. J. Daniell Junior High School. The P.E.C.E. Program, initiated by the State of Georgia, is in its fourth year in Cobb County. A coordinator accompanies students into the business community to observe workers on the job at all levels including semi-skilled, skilled, semi-professional and professional occupations. Students have the opportunity to observe work settings and job characteristics and to interview workers about their feelings related to their respective occupations. A flexible schedule is utilized for this program so that ample time is given for such on-site visitations. In classroom sessions, prior to and following field trips to on-the-job sites, students in the P.E.C.E. Program discuss the various jobs which they will or have observed, including skills required, educational requirements, work settings, fringe benefits, work hours, job characteristics relative to self-characteristics, and any change in their expectations and their feelings as a result of the trip.

In terms of course offerings, the first major decision point in the Career Development approach occurs at the ninth grade level. Students choose one of three (3) broad occupational areas for in-depth exploration, basing their choices on previous experiences, exposure, and exploration. These broad occupational areas are: (1) Human Services

occupations, (2) the Industrial Arts occupations emphasizing construction and manufacturing, and (3) Business and Distribution occupations. Teachers at the ninth grade level meet periodically for planning and identifying specific ways that English, science, mathematics and social studies can be related to given activities in each of the aforementioned broad occupational areas. A significant part of the Career Development Program in the middle school is the continued community involvement through field trips into the community and resource people into the classroom.

At the secondary level, tenth grade students at Sprayberry High School may choose a class in career exploration, a class in general business or those classes more specifically relevant to occupational goals in the professions, etc. The student choosing the career exploration class rotates through the six (6) occupational areas of training offered by the Vocational Department at Sprayberry High School. There he is introduced to each of those occupations and subsequently, to similar occupations and to the characteristics skills, and educational steps pertinent to still a wider range of occupations at varying levels.

The student choosing the general business class is introduced to typing, bookkeeping, office practices and other such activities and, as in the Career Exploration Program, the relevance of mathematics, English, science, and social studies, in this case, to business occupations.

Those students pursuing occupational goals in the professions are choosing quarter courses that facilitate preparation for attaining their goals. All students are exposed to the unit approach through their Language Arts, Science, Math, and Social Studies classes. As in the middle school, subject area concepts and skills are presented in such a way that they can be applied to individual career choices. This unit approach is continued through the eleventh and twelfth grade years.

For those students identified as potential dropouts there is a Program of Cooperative Vocational and Academic Education (C.V.A.E.) in addition to those activities previously mentioned. A.C.V.A.E. Coordinator meets one (1) hour per day with such students to further strengthen the relationship of the various subject matters to each other, to the world of work, and to actual job situations in which these students are engaged. The Coordinator works as a liaision between the community and the school in helping the students to obtain after-school employment and to relate that employment to their schooling. At the eleventh grade level, based upon information and exploration as mentioned above, the student may choose to enroll in the Vocational Department of Sprayberry High for job-entry level preparation in drafting, electrical construction and maintenance, graphic arts, radio and television repair, sheet-metal and welding or data processing; or he may choose any one of a number of cooperative programs such as Diversified Cooperative Training (D.C.T.) Vocational Office Training (V.O.T.) or Distributive Education (D.E.); or he may continue to choose those classes necessary to pursue an occupational goal in the professions.

At the twelfth grade level, the student may continue any one of those opportunities listed at the eleventh grade level and in addition he may choose the Senior Plan in which he attends the Marietta-Cobb Area Vocational Technical School for specific occupational preparation while graduating with his high school class.

At the secondary level, the emphasis is one of preparation for the next step through more specific occupational-skill preparation.

The guidance function is vital at all grade levels in the Cobb County Occupational and Career Development Program with special emphasis at the secondary level to provide every student with information about occupational choices as well as educational avenues. Culminating the guidance function at the secondary level is a Placement Program drawing upon a Placement Coordinator, Man-Power, agencies, guidance counselors, business personnel departments and other community resources in helping each student exiting the school to make his next step whether that be employment, further training, or higher education.

GENERAL INTRODUCTION

Career Development elementary units are an attempt to involve all youngsters in an approach to total education. Not only does the unit approach emphasize the relation of subject matter to the community outside the school, but also it seeks to introduce students to different career clusters found in that community. In addition, this approach stimulates self evaluation by youngsters; that is, each student becomes more aware of himself in terms of strengths, weaknesses, abilities, likes and dislikes, etc. Implementation of the Career Development approach will also offer decision-making practice for youngsters and will encourage active participation of all students to the extent of individual capabilities.

Six elements form the base for the Career Development method -- resource persons, field trips, role playing, occupational awareness, subject matter tie-in and manipulative activity. Through the relation of subject matter to different occupational areas, student learning skills are strengthened and awareness of career characteristics is increased. A field trip provides youngsters the chance to see workers in their work environment, utilizing the "school subject" skills, knowledge and information appropriate to that role. Classroom resource persons also provide students with first-hand knowledge as they share job feelings, information and interests and answer student questions. By role playing various occupations in the unit study, students gain personal insight into that job and are able to experience some of the actual responsibilities, duties and feelings associated with that work role. The final element, the hands-on activity, attempts to unite the other elements in an activity that closely approximates the characteristics of the career cluster being studied, thus allowing youngsters to put their classroom academic skills and occupational information into actual practice.

NOTES TO THE TEACHER

Included in this resource guide is a broad range of ideas for classroom activities and suggested materials from which teachers may choose. It is emphasized that this guide is a resource unit containing numerous ideas gathered from teachers' classroom experiences. In planning a unit around this resource guide, teachers are encouraged to select and combine activities to develop a teaching unit to meet the needs and interests of a particular class.

This unit format has been developed as the most convenient method of organizing the materials and activities in order; beginning with objectives and concepts, including motivation and study activities, and concluding with evaluation techniques, materials lists, and bibliographies. The six (6) elements of the Career Development approach are included in this guide, but it is the individual teacher's ordering of them that makes his class's unit unique.

THE SCHOOL

CAREERS IN PUBLIC SERVICE

GRADE 1

TEACHERS RESOURCE GUIDE

INTRODUCTION

Designed initially for the first grade, this unit seeks to introduce primary students to all phases of school operation and organization. Since beginning first graders may have little or no experience with schools, this unit is basically written to orient them to school activities. The chief focus of this unit is the introduction of the student to the concept of the school as a multi-operational institution with diverse personnel needs. This unit will present students with information concerning a wide variety of school-related occupations by involving them in activity-centered learning processes. Concern for the whole child is one main objective considered in the formulation of this unit as it is felt that children may benefit in more than one way from unit directed activities. In addition to the information gained, the child may benefit in a positive way from the social interaction and involvement with other children that unit activities provide him.

I. OBJECTIVES AND CONCEPTS

A. OBJECTIVES

1. General objectives
   a. To help children learn to work with others in a cooperative effort.
   b. To broaden students' knowledge of the functions and operations of the school.
   c. To stimulate student respect for persons, regardless of their occupations.
   d. To broaden student knowledge of the world of work.
   e. To familiarize students with the layout of the physical plant of the school.
   f. To emphasize the idea that school can be fun.
   g. To create additional opportunities for the child to participate in the decision-making process.
   h. To increase student knowledge of his role in relation to the community.
   i. To give the children additional opportunities for identifying their self-characteristics in relation to those of school workers.
   j. To broaden the base of student experience by incorporating content skills into activity-centered learning situations.

2. BEHAVIORAL OBJECTIVES
   a. At the end of the unit study, the students will be able to describe duties associated with at least three (3) school positions.
   b. Students will be able to name ten (10) out of twenty (20) occupations directly related to schools.
   c. Following the unit study, students will be able to recognize pictures of school workers and identify the role depicted with 75% accuracy.
   d. Students will be able to relate an oral definition of the term school.
   e. At the end of the unit study, learners will be able to associate pictures of school workers with the actual appropriate "tools" of their positions with 75% accuracy in their answers.
   f. Students will be able to list orally at least three (3) differences between the role of the principal and that of the teacher.
   g. Learners will be able to arrange grade levels in their prospective order -- nursery school, kindergarten and elementary.

B. CONCEPTS

1. A school is a place, building or institution for the instruction of children. Also, a school is defined as an institution for instruction in a skill or business.
2. School is a Latin word derived from the original Greek skhole which meant leisure employed in learning and instruction.
3. Early Greek schools were quite different from our modern schools in that only boys attend, school was held outdoors because there were no school buildings and classes lasted all day.

4. In early schools, there were no books so pupils spent most of their time listening to the teacher lecture and discuss problems.
5. After the passing of the Greek and Roman civilizations, schools came under control of the church. Pope Gregory I sent monks to England to begin a school which is recorded as the first one in England.
6. With the invention of the printing press and movable type, education gained a new teaching tool since books became more readily available.
7. The Dutch were among the earliest people to provide free education to children.
*8. American public schools were officially begun when the colony of Massachusetts initiated a system of public education run by the government and supported by the people for the benefit of all children.
*9. From earliest Colonial times, girls as well as boys went to school in America.
10. Originally high schools in America were attended only by those wealthy young men who intended to go on to college or to become preachers. Benjamin Franklin founded an academy which functioned to prepare young men for various fields in private and public life by instructing them in a wide field of subjects.
11. These academies were the forerunners of our modern high schools.
12. In our modern school systems, many people are involved in the operation both directly and indirectly.
13. The physical plans for schools are made to enhance the learning activities that take place.
14. Schools are designed to facilitate the safety and well-being of students and administration.
15. The school is an integral part of the community and functions best when it serves as many of the community needs as possible.
16. Schools function to create well-rounded individuals through a variety of activities.
17. Many different kinds of schools exist to serve particular age or interest groups. Examples of these schools are business schools, trade schools, art schools, cooking schools, etc.
18. Although the majority of American students attend public elementary and high schools, many private institutions function to serve parochial and special interest groups.
19. A school is more than just a building; it is chiefly the people involved.
20. One way in which schools serve youngsters is by providing a means for social interaction.
21. A need will always exist for some type of school.
22. Schools aid students in significant ways when they provide them the opportunity to make individual choices.
23. One of the schools's primary goals is to broaden the student's outlook on life.
24. Most school-related occupations are equally applicable to members of both sexes.

II. SUBJECT MATTER

A. DEFINITION OF TERMS

1. School: A school is an institution for the instruction of children.
2. Teacher: One who teaches, especially one hired by a school to teach or impart knowledge, instructions or skills.
3. Student: One who attends a school, college or university.

B. VOCABULARY

1. School
2. Teacher
3. Student
4. Principal
5. Dietitian
6. Cafeteria
7. Librarian
8. Secretary
9. Kindergarten
10. Elementary
11. Nurse
12. Superintendent
13. Cook
14. Custodian
15. Nightwatchman
16. Bus Driver
17. Safety Patrol
18. Traffic Policeman

*C. HISTORY OF SCHOOLS

1. Schools have been in existence thousands of years.
2. Early Greek and Roman schools were attended by boys only, were held in the open air and lasted all day long.
3. In 570 A.D., the schools passed into control of the Catholic Church.
4. Gutenberg's invention of the printing press between 1438-45 gave schools and education a new tool with which to teach.
5. Many Middle Ages schools were run by the guilds which were trade organizations similar to present-day trade unions.
6. The first known public school was founded in the Netherlands in the 1300's.
7. The colony of Massachusetts was the first to start a system of public education in America when they began a system of schools run by the government and supported by the public for all children.
8. Early American Schools were modeled after English ones.
9. Public elementary schools flourished in the United States in the 18th Century.
10. The tradition of public education continues today.

D. PAST SCHOOLS

1. The most common schools were the "one-room schoolhouses" with one teacher instructing all children in all grades.
2. All grades were centered in one area.
3. The curriculum was centered around "reading, 'riting and 'rithmetic."
4. Individualized instruction was extremely rare.

* Boehm, THE STORY OF SCHOOLS

5. Generally, schools were operated as "blab schools" in which students recited lessons aloud in unison.
6. There were very few teaching aids or textbooks. Hornbooks were early study aids as were primers.
7. Discipline was very strict with the dunce cap and birch rod the order of the day.

E. PRESENT AND FUTURE SCHOOLS

1. Present
   a. Teaching aids are many and varied -- books, audio and visual equipment, curriculum materials, etc.
   b. Programmed instruction is becoming more common with an individual child working with a teaching machine or computer.
   c. Televised class instruction with no teacher present is a practice gaining wider use.
   d. Classrooms are larger and more flexible with movable walls and partitions in place of fixed walls.
   e. School facilities now extend beyond classroom limits and incorporate community and national resources.
   f. Individualized instruction is on the increase.
   g. The curriculum has been changed to accomodate shifts in society.
2. Future
   a. Schools may become increasingly more flexible in building design and will house accomodations for large and small groups and individual learners.
   b. Present teaching aids will be improved and refined to provide teachers with helpful techniques.
   c. Individualized instruction will continue to be a common practice to allow children to work on their own level and at their own pace in some areas.
   d. Televised instruction may be expanded.

F. TYPES OF SCHOOLS

1. Public
2. Private
   a. Parochial
   b. Racial and ethnic group schools
   c. Specialized training schools

G. LEVELS OF SCHOOLS

1. Nursery schools
2. Kindergartens
3. Elementary
4. Middle School
5. Junior High
6. High School
7. Junior College
8. Colleges and Universities
9. Graduate Schools

III. OCCUPATIONAL INFORMATION AND DESCRIPTION

*A. GENERAL DESCRIPTION

Teaching, especially elementary school teaching, is the largest field of professional employment for women and is an expanding one for men. In addition to the large number of classroom teachers, there is a large number of special teachers, principals, supervisors and superintendents working in both public and private elementary schools. Other professional people in the elementary schools include librarians, dietitians and paraprofessional teachers' aides.

Besides these professional workers, many people are involved as support personnel in elementary schools. Non-professional workers include bus drivers, cafeteria workers, secretaries, clerks, maintenance workers and custodians and security personnel, whose services are vital to the smooth functioning and normal operation of the school.

B. JOB ENTRY AND PREPARATION

A person desiring employment in the field of education should check the necessary requirements for the particular job he desires and prepare himself for the job whether it involves professional college training, graduate study, vocational school training or general knowledge and experience.

*C. GENERAL REQUIREMENTS

Every state in the United States requires public school teachers to have a certificate and some States also require parochial and other private school teachers to be certificated. Certification requirements vary from State to State but the most common requirements are four (4) years of college training with a certain amount of professional education courses.

Other professional personnel must fulfill certification requirements in order to be qualified to hold a job in a school system. Individual States and school systems within the State may have different requirements for professional workers.

Non-professional workers such as cafeteria workers must meet Health and Sanitation Qualifications and have a regular physical examination. Bus drivers must meet licensing requirements and maintain a good driving record.

D. WORKING CONDITIONS AND BENEFITS

Teachers and others who work directly in the schools may expect to work fairly regular hours and have liberal designated holidays. One drawback of the teacher's job is that she regularly must take work home with her after regular

school hours in order to make plans, grade papers, prepare assignments, etc.

Other school workers such as custodians and cafeteria workers have regular working schedules which may involve their arriving at school early in the morning before students and other workers must report.

For a person dedicated to working with children and interested in helping them learn more about themselves and the world in which they live, teaching and working directly with the elementary school is an excellent choice of an occupation.

E. SAMPLE CAREER DESCRIPTIONS

1. Teachers
   a. Kindergarten and nursery school
      (1) Some schools require formal college preparation or else specialized training in child development. Public school Kindergarten teachers are required to have a college education. In this, as in other positions in education, patience, understanding, enthusiasm and energy are required for success.
      (2) Teaching duties include the following:
         (a) Instruction in good health and safety habits.
         (b) Instruction in basic math procedures (counting, straws, reading calendars and clocks, students' weighing themselves, etc.)
         (c) Introduction to reading made through story telling and picture books.
         (d) Introduction to music accomplished through singing and dancing.
         (e) Emphasis on student relations; fostering communication and satisfactory adjustments.
   b. Elementary Teachers
      (1) A minimum of a Bachelor's degree with a certain number of hours in education, plus student teaching experiences as part of the curriculum is necessary for certification in this field. It is highly important that the teacher enjoy working with children and delight in their enthusiasm, curiosity and energy. The elementary teacher must be able to talk to children on their level with no element of condescenscion toward them.
      (2) The classroom teacher is responsible for basic subjects and utilizes various types of equipment and visual aids to make presentation of the lesson more stimulating and effective.
      (3) Ideally, the teacher maintains good lines of communication with the parents and community.

   c. Special Teachers
      (1) Teachers of Exceptional Children

(a) Such a position involves highly specialized college preparation to deal with problems of this area.
(b) This teacher must be especially patient and skillful in her dealings with others.

(2) Teachers of Physical Education
(a) In this field, an individual is chiefly concerned with the physical (and mental) well-being of his students. This person must have special training in planning and handling the activities and exercises.
(b) A great amount of energy and enthusiasm is demanded by this position.

(3) Teachers of Art and Music
(a) These positions require special preparation in art and music education.
(b) Acting as consultants and resource people, these teachers supplement the regular program of art and music in the classroom.

(4) Teachers' Aides and Paraprofessionals
(a) Some training or special preparation is necessary for this position.
(b) Duties center on clerical and professional assistance of classroom teacher in her duties.

(5) Teachers of Speech
(a) A minimum of a Bachelor's Degree is required here.
(b) Associated duties include: identification of individual problems, referral of severe problems to proper attention, and administration of basic speech exercises.

2. Associated Personnel
1. Librarians
a. A Bachelor's Degree in Library Science is a necessary prerequisite for this position.
b. The librarian's duties must include: planning or physical arrangement of library, assisting readers, selecting and purchasing supplies, supervising use of audio-visual equipment, and organizing reference materials.

3. Special Personnel (nurses, counselors, social workers, etc.)
1. School Nurse
a. Depending upon the school, the nurse may be a registered nurse, licensed practical nurse or a volunteer parent or aide.
b. Among the duties of the nurse: treatment of minor medical problems, administering and supervision of tests (hearing, vision, etc.) and advising on health problems.
2. Counselors
a. Educational and experience requirements vary widely from state to state.

b. Counselors are involved in testing and evaluation of students, advisement of career and education problems. Many times they are expected to solve or mediate communication problems the student may have with home or school.

3. School Psychologists
   a. Minimum requirements are a M.A. Degree.
   b. Their work is usually directed toward helping the emotionally disturbed, delinquent, the truant or so-called "problem-child", or preventing his problems before they occur.
   c. Also, they work to aid teachers and administrators in understanding psychological concepts of their students.
4. Visiting Teacher (school social worker)
   a. Requirements of education and experience vary from state to state.
   b. Student problems affecting performance and attendance are the main focus of this position. This position involves concentration on community and family situations as they affect the student in school. With this special knowledge of the student's home problems, the teacher is able to inform and assist other staff members.

4. Principals
   1. This position requires a minimum of a Masters Degree in Administration. Ideally the principal should be a person well-suited to working with a variety of people and adapted to solving numerous problems associated with the school.
   2. Responsibility for all activities of the school rests on the Principal, including the selection and support of teaching personnel. Also, the principal acts as the administrative link between the policy-making Board of Education and the active personnel in the schools.
5. Superintendents
   1. Depending upon the size of the system, minimum requirements may vary from Master's Degree to the Doctorate level of Administration. A wide range of educational experience in all phases of the field would be advisable for this position.
   2. Basically, he is a top executive in a large enterprise with most of his attention directed toward the educational policy of his sytem.
6. Supporting Personnel
   1. Office Personnel
      a. Ordinarily this position requires no specialized training beyond general secretarial skills.
      b. Duties would include the following clerical activities.
         (1) Responsibility for all telephones
         (2) Responsibility for public address announcements
         (3) Responsibility of Principal's correspondence
         (4) Responsibility for filing of school records
         (5) Responsibility for processing purchase orders of supplies and equipment.

(6) Responsibility for greeting and welcoming visitors and the public.
(7) Responsibility for handling school attendance records (ADA)
(8) Responsibility for handling school supplies for classroom use (paper, pencils, erasers, chalk, etc.)
(9) Responsibility for mimeographing materials for teachers' use.

2. Cafeteria Personnel
   a. Dietician
      (1) Educational requirements include a Bachelor's Degree in Home Economics with concentration in food preparation and planning.
      (2) Duties would include: planning nourishing, appetizing and wholesome menus at low cost, and supervising all aspects of food preparation from selection and purchase through actual serving of meals.
   b. Cook
      (1) Experience and education requirements include a high school or vocational school education and the most important requirements -- on-the-job training. Special requirements would be a close attention to personal cleanliness, a keen sense of smell and taste, and ability to cooperate with group. Health Department regulations demand periodic personnel medical examinations. Observance of State Sanitation requirements for personnel and plant is necessary. A certain amount of physical activity is involved.
      (2) This job involves the actual preparation of finished meals from the prepared foodstuffs.
   c. Cook's Helpers
      (1) On the job training and experience would be the most important preparation for this job. This position is a fairly active one, as tasks involving a degree of physical strength are involved.
      (2) Various assignments in this area.
         (a) Food preparers (organization of food and utensils to be utilized by cooks)
         (b) Food servers (handle actual dispensing of food)
         (c) Dishwashers and "clean-up" crew. (responsible for cleaning of utensils and facilities; also, they must see that equipment is ready when needed). Ordinarily these various tasks are rotated among the kitchen personnel so that no one person handles the same duties continuously.

7. Maintenance Staff
   1. Chief Custodian
      a. His education and experience preparation for this position would involve a vocational education and a variety of actual work training. A custodian must have a knowledge of all phases of maintenance. As this job involves physical labor, strength and energy are definitely required.
      b. Cleaning and maintenance duties are the main concern of this job. Various duties involve:
         (1) Changing light fixtures
         (2) Replacing pencil sharpeners
         (3) Making plumbing repairs
         (4) Emptying and disposing of waste
         (5) Maintaining and caring for lawns, shrubbery, and landscaping.
         (6) Making minor repairs such as replacement of broken glass and damaged items.
         (7) Regulating heating and cooling of physical plant.
         (8) Raising and lowering flag.
8. Security Personnel
   1. Nightwatchman
      a. Special training in law enforcement and crime prevention is demanded by this job. Mental alertness and good physical health are two important requirements because of the job conditions. Ability to work alone for long periods without supervision is an additional requirement.
      b. His duties involve the supervision and protection of school facilities after school hours and on weekends.
   2. Crossing Guards (traffic supervisors)
      a. This position requires a regular police officer, or someone trained in traffic and pedestrian control. The nature of this job (weather conditions, hours, degree of danger, etc.) demands that a person be in excellent physical and mental condition.
      b. Duties include the control and supervision of traffic at intersections and crosswalks near school zones and aiding students in crossing streets.
   3. Safety Patrols (students)
      a. These people are mature students who assist the traffic officers at busy intersections near the school.
      b. These patrolmen may also help teachers supervise playgrounds.

9. Transportation (school bus drivers)
   1. No specific educational preparation is needed, but applicant usually has to pass both written and physical examinations. Special requirements are an operator's license and a minimum of one year's

driving experience. The most important requirements are good vision, steady nerves, quick reflexes, excellent co-ordination, a sense of humor and friendly disposition.

2. Duties: the driver is responsible for the safe transportation of students between home and school and he is responsible for maintaining good operating condition of his bus.

F. PERSONNEL LISTINGS
1. Classroom teachers
2. Principal
3. Visiting teacher (social worker)
4. Physical education teacher
5. Art and music teachers
6. Superintendent
7. School psychologist
8. Counselors
9. Speech teachers
10. Teacher aides/paraprofessionals
11. Librarian
12. Secretaries and office workers
13. Dietician
14. Cafeteria workers
15. Custodian and staff
16. Bus driver
17. School policemen (crossing guards)
18. Patrolmen
19. School nurse
20. Nightwatchman

G. INSIDE POSITIONS WITH MODERATE PHYSICAL ACTIVITY
1. Teachers
2. School nurse
3. Principal
4. Office personnel
5. Art and music teachers
6. Speech teachers
7. School psychologist
8. Counselors
9. Teacher aides/paraprofessionals
10. Librarian

H. INSIDE POSITIONS WITH MORE PHYSICAL ACTIVITY
1. Dietician
2. Cafeteria workers

I. INSIDE – OUTSIDE POSITIONS WITH MORE PHYSICAL ACTIVITY
1. Physical Education workers
2. Custodian
3. School policeman
4. Bus drivers

J. OUTSIDE POSITIONS WITH PHYSICAL ACTIVITY
   1. Nightwatchman
   2. Crossing guards

IV. MOTIVATION ACTIVITIES

A. Take a walking field trip to any one of the various school departments or facilities; or, take a walking trip around the school grounds and buildings. After the trip, discuss with the class the definition of the term school and talk about the various people who are involved with the operation of the school. Talk about the people who work at the school, the people who take care of the students, the people who take care of the school buildings to see that they operate smoothly, etc.

B. Bring in pictures of various school workers, charts of school organization, posters, etc., and make a bulletin board or display in one corner of the room. Call the class's attention to the display and have a short discussion period related to the material.

C. After identifying different workers in different departments in the school, provide the students with assorted materials to make a hand puppet to represent one of these workers that interests them. Materials used might be socks, yarn, buttons, oatmeal containers, glue, construction paper, scraps of material, etc. Puppets might be used in acting out skits or in oral language activities.

D. Choose a film or filmstrip such as "School Bus and You," or "School Children," to show the class. Have a short discussion period after the film to talk about what was seen in the film. This activity might be a good stimulus for an oral language activity such as class sharing of personal experiences and feelings about school and school workers.

E. Bring in a map or design of the school plant and initiate a discussion related to the various departments seen in the design. Talk about the work that is done in the various departments, the people who do the work and how these people serve the students. After the discussion, bring in cardboard boxes, clay, wood scraps or other building materials and have the class begin building their own model school.

F. Make a display of library books and other materials related to schools and school workers and encourage students to use them and look at them during their free time.

G. Gather and display various "tools" of school workers and call the class's attention to the display. Some "tools" that might be used are the teacher's pencils, chalk, record books and stencils; the mixing spoons, forks and bowls of the cafeteria workers; the steno pad, pencil and attendance book of the school

secretary; the gloves, broom and other equipment used by the custodian. These could be used in role-playing activities.

V. STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Begin motivation activities and use throughout the unit when needed to maintain student interest.
2. After various work roles have been identified, introduce role playing activities to the class. Set up different situations involving various workers and school personnel (dietitian and cafeteria workers, teacher and students, principal and students, etc.) and have the children interchange roles so that they experience feelings related to each one.
3. Begin working on project ideas -- identifying sources of materials and supplies. List ideas for future development and work with class on projects, resource persons, field trips, etc.
4. Collect pictures of different types of schools and make a bulletin board or display. Another display topic might be "Schools -- Then and Now" in which pictures of old and new schools, classrooms, teaching aids, etc. could be used for contrast.
5. After children have become more familiar with some of the school workers, introduce the game called "I am . . . I Am Not" in which each child assumes the identity of a different worker and gives the other children verbal clues about his identity. An example might be "I Am A School Worker. I Am Not A Principal. I Work With Things and People. I Am Not a Librarian. I Am A Cafeteria Worker."
6. Invite a resource person to visit the classroom and share experiences with the students. Some good choices might be the Dietitian, Custodian, Principal, Special Teachers, etc.

B. RESEARCH ACTIVITIES

1. Students could continue their work on building the model of the school. In connection with this activity, the class could talk further about the physical plant of the school, the rationale behind certain facilities and arrangements, the people who service the school and the many ways the school can be used. Additional field trips to the different departments might be effective here.
2. Using magazines to find pictures, students could cut out pictures of schools and school activities, mount them on thin sheets of cardboard and draw irregular lines on them. With the teacher's help, the pictures could be cut into puzzle pieces to be assembled by the students and used in activities to reinforce vocabulary learnings.
3. Wall charts of vocabulary words, occupational listings could be illustrated with student drawings, cut out pictures, etc.
4. Scrapbooks or picture dictionaries could be made to illustrate new vocabulary terms. Individual students could be responsible for making the new pages and illustrating them.

5. Dramatize the total school day -- all phases and all activities from the beginning to the end of the day. Allow the children to assume the roles related to the different phases and experience the feelings of each role.
6. Work in groups to plan cafeteria menus for a week. During this activity, talk about how the cafeteria workers and the dietitian work to plan menus, prepare and serve the food and clean up after the meal. Include some discussion of the preparation and skills needed in these jobs. Having a cafeteria worker talk with the students would be helpful here.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Make vocabulary charts of new words, terms and occupational listings to put on the wall. Children could illustrate with artwork or magazine cutouts.
   b. Select appropriate films, film strips or teaching tapes to use as part of classroom activities. Some choices might be "What Can We Contribute to Our School," "How Can Our Schools Teach Us Good Citizenship," "School Bus and You," "School Children."
   c. Have individuals create artwork and use magazine cutouts to make pages of vocabulary terms for picture dictionary. Assemble pictures into central scrapbook and encourage students to read and work with it during their free time.
   d. After hand puppets are made in other activities, use them in oral language exercises such as dramatizing stories, skits and short scenes from school activities. The puppets might be used as the characters in a play or short skit that depicts the various workers in their work roles.
   e. Students could also role play the various occupations identified. Encourage them to interchange roles to experience all feelings.
   f. Select stories related to schools, school activities and workers to read to the class. Obtain simple titles such as I WANT TO BE A TEACHER or HOW DO SCHOOLS HELP US for the children to read and report on.
   g. Plan writing lessons on topics related to school workers and school activities.
   h. Talk about the language and communication skills used most by school workers in their jobs. Devise situations in which students role play various jobs to see how these skills apply.

2. Mathematics
   a. Practice simple counting and enumerating by ones skills by having a mock inventory of library books, films, supplies, cafeteria charts, etc. Then have the children count the items by two's (2's) and five's (5's).

b. Talk about some of the various math skills necessary for school workers in their roles: counting; measuring quantities and lengths; computing prices and expenses; telling time, etc. Use role-playing activities to help children see how these math skills are applied.
c. Let each student keep his own copy of "Daily Attendance" figures for his class for a week and total the number present.
d. Devise work stories and problems related to preparation of cafeteria meals -- measurement of ingredients, portions, quantities, etc. Use basic addition and subtraction skills in these problems.
e. Have children demonstrate their understanding of odd and even, less than - greater than concepts by arranging students or objects in the room to illustrate these learnings.
f. Reinforce learning of money values -- pennies, nickles and dimes by having students be responsible (with teacher assistance) for collection of milk money.
g. Have children prepare simple orders for cafeteria, custodial or classroom supplies, figuring prices from a catalog and using basic addition and subtraction skills.

3. Social Studies
   a. Talk about the various ways that schools help individuals and the community -- helping children and adults get necessary education serving as place for social interaction and adjustment to the group situation, providing enriching experiences for the community by serving as a central meeting facility, etc.
   b. Continue an activity begun in the Research Exercises and talk further about the physical layout of the school. Use the model school built by the students and compare/contrast it with a map or design or their own school building. As an additional activity, have the children make designs or drawings of schools. Add these to bulletin board display.
   c. Discuss the differences in present day schools and schools of long ago such as the one-room types. Make a mural depicting examples of these schools having children talk to their parents, older persons and read simple books to get ideas for the mural. Some questions that might be used in the discussion period are: How are these schools different and how are they alike. Which one had the most teaching aids? Which one would you like to attend? Why?
   d. Talk further about the various occupations directly and indirectly related to the school. Discuss characteristics of jobs -- whether they involve working with people or things mostly, how much physical activity is involved, whether the work is mostly indoor or outdoor, etc.
   e. Make a wall chart depicting the various grade levels in public school systems. Mention the chart and talk briefly about how Public Education came about and how it is supported. Then introduce the idea

of Private Schools and talk about Public and Private Schools are alike/different.

4. Science and Health
   a. Talk about the need for good nutrition and eating habits. Relate the dietitian's and cafeteria workers' jobs to this need for providing good, nutritious meals, especially for growing children. Study basic four (4) food chart and then analyze school lunch menus for one (1) week according to the requirements.
   b. Do simple experiments to illustrate chemical changes or changes in states of matter occurring around the school. Making bread and observing the action of the yeast; making Jello and watching it gel from a liquid to a semi-solid; watching the changes as water freezes into ice and then melts back into water, etc., are some simple activities.
   c. Discuss some of the simple machines used by school workers in their jobs. Some obvious examples are levers, wheels and screws used by custodians, cafeteria workers, etc. Talk about how these machines aid workers. Students could make some of these or use them in class activities to demonstrate their effectiveness.
   d. Discuss importance of light and ventilation in schools and regulation of heating and cooling for comfort. Talk about the possible effects being comfortable and being able to see well have on learning.
   e. Notice the various building materials used in the construction of the school plant -- relate the materials and design used to the local climate and conditions. Talk about what other materials and designs might be used in the colder/warmer climates.

5. Art
   a. Use butcher paper and tempera paint to make a mural depicting various scenes in school life.
   b. Discuss the color spectrum and importance of interior color schemes in the school. (Neutral shades of basic, restful colors.) Analyze the color chart to determine why certain colors are used for school buses, stop signs and protective clothing for policemen and crossing guards.
   c. Apply knowledge of color spectrum to the selection of "eye-pleasing" foods (green, yellow vegetables contrasted with orange and red trims, etc.) Do activities with cutouts of magazine "food" to demonstrate this idea.
   d. Make puppets of assorted materials such as socks, tin cans, string, rushes, buttons, yarn, stockings, cardboard tubes, scraps of felt and material, etc.
   e. Have students do individual pictures of school activities and school activities and school workers that interest them, using crayons, pastels, watercolors, etc.

6. Music
   a. Sing and act out songs pertaining to schools ("People on the Bus")
   b. Write rhymes related to school safety, courtesy and manners and set them to familiar tunes.

D. CULMINATING ACTIVITIES
1. Conclude walking tours of the school plant.
2. Help prepare a hall display or bulletin board on "Schools of Yesterday, Today and Tomorrow."
3. Arrange to have a school bus available for a brief tour, especially for those who don't ride one regularly. Talk about how bus drivers aid students.
4. Demonstrate and reinforce the use of good table manners in the cafeteria.
5. Plan and execute "Hands-on" Activities.
6. Reshow any interesting films or filmstrips.
7. Give oral or written post-unit evaluation.

E. FOLLOW-UP ACTIVITIES
1. Review activities and research of unit.
2. Include unit vocabulary terms, spelling words, in new word games, such as "Baseball."
3. Continue playing "Who Am I - What Am I" and "I Am-I Am Not" games with terms and characters from the unit study.
4. Select reading stories occasionally that relate to unit activities.
5. Play with puzzles and puppets made during unit.

F. SUGGESTED HANDS-ON ACTIVITIES
1. Use refrigerator box to make school bus -- cut out doors and windows, use extra cardboard to make tires and steering wheel. Paint bright yellow or orange, trim with black and use in role playing activities.
2. Make a model school building from assorted cardboard or shoe boxes, clay, wood scraps, etc., and use in related activities.
3. Utilize cardboard boxes to make such things as the principal's or secretary's desk to use in role playing simulations. Devise role playing situations in which individuals assume the roles of teacher, superintendent or principal and experience the responsibility of making administrative decisions, deciding on rules and punishment for breaking them, etc.
4. Obtain supplies to make simple snack or lunch of soup, sandwiches, cookies, milk and fruit. Allow class to organize into groups to plan menu, make arrangements, set table, prepare and serve food and handle clean-up procedures afterward just as cafeteria workers do.

VI. MATERIALS USED

1. Charts
2. Pictures for bulletin boards
3. Films and filmstrips (See Curriculum guide)
4. Scrapbook
5. Filebox
6. Index Cards
7. Cardboard boxes
8. Refrigerator boxes
9. Scissors
10. Construction paper
11. Kitchen utensils
12. Tempera paint
13. Butcher paper
14. Poster board
15. Pins
16. Magazines
17. Paste or glue
18. Real or "play" currency and coins
19. Color chart
20. Basic Food Group Chart
21. Typewriter
22. Telephone
23. Chalk
24. Mops
25. Brooms
26. Pail
27. Thermometer
28. Band-aids
29. Whistle
30. Hand tools
31. Paint brushes
32. Office Supply Catalog
33. Pointer
34. Pencils
35. Pastels
36. Materials for music instruction
37. Patrol straps and badges
38. Steno pad
39. Clay
40. Socks
41. Yarn
42. Buttons
43. Cardboard tubes
44. Felt
45. Oatmeal containers

VII. EVALUATION

A. SELF-EVALUATION

1. Did I plan effectively, utilizing methods and materials wisely?
2. Did I cover all six (6) elements of the Career Development approach sometime during the course of the unit study?
3. Did I generate the maximum level of interest and participation through effective motivation activities?
4. Did I maintain a classroom atmosphere conducive to learning?
5. Did I involve the students in the planning to the maximum degree possible?
6. Did I plan activities effectively to include each child to the best of his ability?
7. Did I program activities so as to individualize instruction?
8. Did I use the most effective means of correlating the subject matter?

B. OBSERVATIONS OF THE CHILD

1. Observe the flexibility of individual role interaction within the group.

2. Observe the child's use of communication skills both as an individual and as a part of the group.
3. Observe for evidence of individual research and task completion.
4. Look for evidence of social interaction skills -- does the child share materials, take turns, accept responsibility willingly and communicate well with his peers?
5. Observe for any evidences of change in attitude toward school-related activities. Look for any changes in attitude toward the world of work.
6. Observe for evidences of strengthening of individual self-images.

C. EVALUATION OF CHILD (ORAL EXAMINATION)
1. Have children match orally pictures of workers to their titles.
2. Have children name orally occupations directly involved with schools.
3. Ask motivating questions to inspire discussion of school-related activities.
4. Have children orally identify various "tools of trade" of school-related occupations.
5. Have children describe duties of at least three (3) school-related occupations.

VIII. NOTES TO THE TEACHER

This unit format has been developed as the most convenient method of organizing the materials and activities in order, beginning with objectives and concepts, including motivation and study activities and concluding evaluation and source material lists. A wide range of materials, facts, ideas, and activities is presented to allow each individual the opportunity to structure his unit to fit the needs of a particular class. Selecting and combining activities, adjusting the scope of the unit, supplementing materials to meet the needs of his class -- all these are teacher strategies that may be used with this unit format. The six (6) elements of the Career Development approach are included in this guide, but it is the individual teacher's ordering of them that makes his class's unit unique.

IX. BIBLIOGRAPHY

A. CHILDREN'S SELECTIONS

Buchoimer, Naomi, LET'S GO TO SCHOOL. Chicago: Children's Press, 1962.
Buchoimer, Naomi, I KNOW A TEACHER. New York: G. P. Putnam's Sons, 1967.
Elkins, Benjamin, THE TRUE BOOK OF SCHOOLS. Chicago: Children's Press, 1962.
Green, Carla, I WANT TO BE A TEACHER. Chicago: Children's Press, 1957.
Hage and Ryan, HOW SCHOOLS HELP US. Chicago: Benefic Press, 1962.
Hoffman, Elaine, SCHOOL HELPERS. Melmont Publishers, 1955.
Mills, Moore and Sheldon, OUR SCHOOL. Boston: Allyn and Bacon, Inc. 1966.

Scarry, Richard, WHAT DO PEOPLE DO ALL DAY. New York: Random House, 1968.

B. TEACHER'S SELECTIONS

Boehm, Peggy, THE STORY OF SCHOOLS. New York: Sterling Publishing Company, 1960.

Ferrari, Erma, CAREERS FOR YOU. New York: Abingdon-Cokesbury Press.

C. ADDITIONAL SOURCES

D.O.T.

OCCUPATIONAL OUTLOOK HANDBOOK

SRA OCCUPATIONAL BRIEFS

D. TEACHING AIDS

1. Teaching Tapes
   a. "How Can Our Schools Teach Us Good Citizenship;"
   b. "What Can We Contribute to Our School?"

GEORGIA STATE CATALOG OF TEACHING TAPES

2. Films and Filmstrips
   a. "School Bus and You"
   b. "School Children"
   c. "School Rules: How They Help Us"
   d. "Safety to and From School"

CATALOG OF CLASSROOM TEACHING FILMS

E. RESOURCE PERSONS AND FIELD TRIP SITES

1. Resource Persons

   Various school personnel can be utilized in providing information on the different phases of school activity. The resource person might be brought into the classroom or maybe consulted during the course of the field trip to that particular area of operation. Some excellent sources of information in the schools would be:
   a. Custodians
   b. Cafeteria personnel
   c. Library staff
   d. Principals
   e. Office staff
   f. Security personnel
   g. Transportation personnel
2. Field Trips
   a. The school plant itself is a rich source of field trips involving the different departments.
   b. There is little need to go outside the school itself for field activities except for the visit to the school bus.

WHAT DOES MY FAMILY DO ALL DAY

Grade 1

Teachers Resource Guide

INTRODUCTION TO THE FAMILY UNIT

Involving first grade students in this activity-centered unit at the beginning of the year serves as an excellent introduction to grade level concepts in social studies. Students gain a deeper awareness of themselves and their relationship with others through their participation in the unit. Through the unit, learners are introduced to the concept of work and this introduction can serve as a basis for further units on the school and the community.

I. GOALS, OBJECTIVES AND CONCEPTS

A. TEACHER GOALS

1. To stimulate the student's awareness and understanding of work as a productive activity.
2. To broaden the student's knowledge of the work community.
3. To stimulate the student's awareness of community work roles filled by parents, relatives and friends.
4. To help the student recognize and appreciate the contributions made by family members through their work roles.
5. To give the student opportunities for identifying his self-characteristics.
6. To help the youngster learn to work well both independently and as a member of the group.
7. To stimulate the student's realization that all areas of work are dignified, deserve respect and contribute to a functioning society.
8. To broaden the student's understanding of his role as an individual contributor to the cooperative effort.
9. To stimulate use of social interaction skills and cooperative attitudes.
10. To give the student opportunities to develop decision-making skills by involving him in the decision-making process.

B. LEARNER (BEHAVIORAL) OBJECTIVES

NOTE: These objectives may have to be adapted to fit the special abilities of individuals within a class

1. By the end of the unit study, the learner should be able to recognize and pronounce a minimum of 75% of the vocabulary words introduced.
2. The learner should be able to relate a working definition of the terms, work and job.
3. The learners should be able to identify a work role filled by a parent, family member or adult friend, and describe some of the characteristics and duties associated with that job.
4. The learner should be able to relate a working definition of the term tool, and give several examples of common ones.
5. The learner should be able to name at least three (3) other work roles identified during the unit study.

C. CONCEPTS

*1. Work has been described as being physical or mental activity, directed toward the production or accomplishment of some desired goal. In some cases, work is understood to be employment, which is work done in return for money, goods or services.

2. People work for many different reasons -- some work to obtain money or goods to support themselves and their families; others work because they enjoy being busy and are interested in a particular project. Some people work because they take pride in their efforts and enjoy creating

things; and others do it, because in our society, work is seen as a significant activity.

3. Individuals may work because of any one or a combination of the reasons listed above; or, they may have other reasons.
4. People may have many different kinds of work activities or work roles. Family members, including mothers, fathers, sisters, brothers and other relatives may have many different jobs or tasks to accomplish as part of their responsibilities.
5. People may have several different work roles at one time; that is, a man might be an insurance salesman on his job, a leisure time wood craftsman and baseball coach for a neighborhood team. A woman might be a store manager, homemaker and volunteer tutor.
6. As part of their work roles or jobs, boys and girls might have school assignments, household chores and a part-time job.
7. People may use many different kinds of tools in their work to help them carry out their duties. Examples of tools used by different people include pencils, books, typewriters, hammers, rulers, brooms, paintbrushes, saws, thermometers, etc.
8. Different work activities require a variety of different skills, abilities, knowledge and aptitudes.
9. All work roles make a contribution to a functioning society and help fulfill some of the needs and interests of the persons filling them.

II. SUBJECT MATTER

*A. DEFINITION OF KEY TERMS

1. Job: (a) An action requiring some exertion; a task; an undertaking; (b) An activity performed in exchange for payment; especially one performed regularly as one's trade, occupation or profession; (c) A position in which one is employed.
2. Tool: (a) An instrument such as a hammer or rake, used or worked by hand; (b) Anything used in performance of an operation; an instrument; (c) Anything regarded as necessary to the carrying out of one's occupation or profession.
3. Work: (a) Employment; a job; (b) The business by which one earns one's livelihood; a trade, craft, business or profession; (c) Something that one is doing making or performing

B. SUGGESTED VOCABULARY TERMS

1. Adult
2. Child
3. Community
4. Duties
5. Family
6. Father
7. Feeling
8. Friend
9. Group
10. Helper
11. Job
12. Mother
13. Parent
14. People

* American Heritage Dictionary

15. Role
16. School
17. Skill
18. Task
19. Tool
20. Work

III. OCCUPATIONAL INFORMATION

A. General Description
B. Job Entry and Preparation
C. General Requirements
D. Work Role Characteristics and Conditions
(This information will be collected by individual students on a particular work role.)

IV. SUGGESTED MOTIVATION ACTIVITIES

A. Design a brightly-colored and attractive bulletin board display with the theme taken from the title of Richard Scarry's book, What do People Do All Day? Use Magazines or commercial pictures to depict people in various work roles.

B. Use the bulletin board to stimulate the children in discussing what they already know about the work community and different work roles.

C. Utilize an audio/visual aid to introduce the concepts of the family to the children. Some aids that might be useful are the filmstrip series, "The Family," (Holt, Rinehart and Winston) and "Families in Action", (Eye Gate House).

D. Encourage students to share their knowledge of their families' and friends' work activities during an oral sharing session.

E. Use the flannel board and cut-out figures to dramatize concepts introduced in other activities. During a story hour, illustrate, concepts through the actions of the fingers of the famiiy members and other people.

F. Read aloud to the students from an interesting story or picture book related to the unit theme. Guide the students in verbalizing their reactions to the story.

V. SUGGESTED STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Begin motivation activities and use throughout the unit to stimulate and maintain student interest.
2. Introduce the unit topic in a short discussion by defining key terms in student language. Read the class a story such as Where I Live or Family Helpers, using the story to generate a discussion of:

a. What is meant by work.
b. Reasons people work.
c. Kinds of work activities done by students.
d. Kinds or work activities done by mothers, fathers, other family members, relatives and friends.
e. Ways that work activities help people.

3. Have a short planning session with the youngsters to outline unit activities. Talk with them about the purpose of the unit -- finding out more about work and the ways that their family members and friends help through their work activities -- and identify possible learning experiences, field trips sites, resource people and material and equipment needs.
4. Start a class scrapbook or bulletin board display of newspaper and magazine pictures of different workers in various work settings. Ask each child to look for a picture to share with the others through an oral activity.

B. RESEARCH ACTIVITIES

1. Use an audio/visual aid in helping the students to define and understand what is meant by a family. Be sure to explain that there are many different kinds of families, all of which are alike in some ways and different in others. Have each child draw a picture of his own family, being sure to place himself in the picture. Or ask each child to bring in a group picture of his family.
2. Talk about the different kinds of work activities done by family members. Begin by asking the students what kinds of work activities they do at school and at home. Help them to see that such home activities as feeding pets, setting the table for meals, picking up toys and taking out the trash are productive work activities and that each individual's work is helpful to the total group.
3. Continue the previous activity with other family members. Use study prints and other pictures to describe the kinds of work done by mothers and fathers both in and outside the home.
4. Make a display of some different "tools" used by various workers in their roles. Display such items as pencils, rulers, hammers, spoons, brooms, measuring cups, books, whistles, thermometers, shot needles, measuring tapes, cameras, drills and saws. Label each took in large letters to aid in word recognition, then help the students define what is meant by a tool. Describe some of the uses of tools displayed, comparing them to the tools used by the class members in their home, school and leisure activities.
5. Guide students in making various charts and posters as "tangible evidence" of their activities. Include such things as:
   a. List of vocabulary words, illustrated with student artwork.
   b. College of pictures of various workers.
   c. "Mommy bags" and "Daddy bags" containing various tools.
   d. Collage of pictures of common tools.
   e. Illustrations of various family members at work.

f. Puppets to represent family members.
g. Experience charts with illustrations.

*6. Explain to the students one of their activities for the unit. Ask each one to talk with a parent, family member or friend about his work role, its characteristics -- sitting, standing, indoor or outdoor work, working with people, information or things, its setting, tools used, etc. Have each youngster draw a picture to represent that person in his work setting and encourage him to invite the person to visit the class as a resource person.

7. Help the students to understand that a person might have more than one work role. Use the examples of a mother who is a real estate agent, homemaker, and volunteer worker; a father who is a construction worker, baseball coach and parent; an older brother who is a student, grocery clerk and family member, to illustrate the concept. Urge the children to devise examples from their experiences as further illustrations.

8. Use role playing techniques to point out the importance of the individuals contribution to the group effort and the need for cooperation. Set up situations such as might happen if a homemaker decided not to do her job, if the father refused to work, if the children wouldn't do their homework or their chores, etc. Allow different children to fill the various roles, then lead them in discussing their reactions and feelings.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Read frequently to the students from library books related to the unit. Lead them in discussing the stories.
   b. Begin making a picture dictionary of new words introduced. Have the children cut out magazine or newspaper pictures or do artwork to illustrate the new words. As another vocabulary enrichment activity, help the students make and use flash cards in individual and small group work. A word wheel would also be an effective aid.
   c. Give students practice in manuscript writing by devising simple writing lessons for them to copy.
   d. Develop experience charts for individual children after they dictate or describe their experiences.
   e. Practice oral language skills through role playing activities, "Show and Tell" periods, question and answer times with resource persons, etc.
2. Mathematics
   a. Give students practice in enumerating by having them count the numbers of tools in a display, the number of children in a row, the number of pictures on a bulletin board, the number of members in a family, etc.

* Susie Raper, Blackwell Elementary School

b. Use objects such as workers' tools, hats or other equipment in introducing and reinforcing concepts of largest, smallest; longest, shortest; lighter, heavier; etc. Encourage the students to manipulate the objects as part of the activity.

c. Introduce set terminology with pictures of groups of workers. Students could identify the set of all workers wearing uniforms, the set of workers doing outside work, the set of all members of the same family, etc. Also, the students could count the number of items in a set and write the corresponding numeral.

d. Begin work in basic addition of one and two place numbers, using figures related to the unit. For example, have the children add two parents and two children to get four people; five workers and four workers to equal nine, etc.

e. Practice numeral recognition and reading skills by having the students write and read the numbers of their home addresses, telephone numbers, ages, numbers in families, etc.

3. Social Studies

a. Introduce the students to the concept of the family with an audio/visual aid, through the use of the flannel board or various doll figures or through a discussion period. Have the youngsters do drawings to represent their own individual family groups including themselves in the pictures. Help them to understand that families may differ in the number and type of members and that families change because of various influences.

b. Lead the students in identifying and describing some of the activities of the family, mentioning work as one very important one. Talk about the different types of work done by different family members and the contribution that each work activity makes to the whole effort. Stress to the children that work involves activites done both in the home, outside the home, and at school.

c. Use role playing techniques to help point out that all work activities are worthwhile and helpful -- to the family and to the community as a whole.

d. Encourage students to talk about various likes and dislikes in terms of home, school and leisure activities. Guide them in this activity by naming several different experiences and getting their reactions. After the point is established that different people may like different activities and hobbies, talk with the students concerning the influence of these likes and dislikes and personal characteristics on the choice of a work role.

e. Involve resource persons in the classroom to reinforce concepts introduced in the previous activity. Also, have students talk with parents and other significant persons about the influence of personal characteristics and qualities on job choice.

4. Science
   a. Introduce the students to tools and simple machines by having examples of many different kinds for them to manipulate and use. Develop simple experiments to demonstrate the use of the wheel, the pulley, inclined plane, wedge and others. Talk about how these tools and machines are used by different workers.
   b. Use other simple experiments to demonstrate how friction is created. Give a child a wooden block to rub against the floor, have children drag their feet on the floor or on the playground to stop swinging, ask them to rub their hands together to feel the force and the warmth. Talk about how friction helps to make things go and stop.
5. Art
   a. Give the students opportunities to use crayons and chalks in doing illustrations of their families, a favorite worker in his work environment or other scenes of interest.
   b. Techniques of tempera painting could be incorporated by having the students work on individual pictures or a mural.
   c. Provide the students magazines and newspapers to use in cutting out pictures of workers for collages.
   d. Give the students materials for making puppets to represent family workers.

D. SUGGESTED HANDS-ON ACTIVITIES

1. Involve each student in interviewing a parent, relative or friend about his work role. Encourage the child to draw or find a picture representing that person's work activity to use as a visual aid in a class sharing session. Each youngster could pantomine or role play the particular role for the other children to guess.
2. Provide a variety of materials such as paper bags, oatmeal containers, buttons, spools, paint, glue, yarn and construction paper for the students' use in making a puppet to represent a worker of interest to them.

E. SUGGESTED CULMINATING ACTIVITIES

1. Display art work, experience charts, tangible evidence and books in the classroom for visiting parents, friends, other teachers, students and the principal to view. Have different children give reports based on the information gathered during their "interviews."
2. Invite several parents or relatives of the children to visit the class as resource persons. Encourage them to give short descriptions of their work roles and their feelings about their jobs. Allow the children to ask questions as part of the discussion.
3. Use the puppets made as part of the hands-on activities in dramatizing stories or events developed by the teacher.

4. Make all necessary arrangements for the class to take a field trip to a site of interest in the community. The site might be the work place of one of the children's parents or it might just be an interesting community site. Prepare the children before the visit and follow-up the trip with a time for talking over their reactions and feelings.
5. Show any remaining films or filmstrips of interest to the students. Discuss them with the students.
6. Play games in which different children pantomine or role play various work roles with which they are familiar. The others could try to guess identity of the work role being portrayed.
7. Have a concluding discussion in which students are encouraged to verbalize their feelings about their participation in the total unit.

F. SUGGESTED FOLLOW-UP ACTIVITIES

1. Capitalize on the interest and knowledge generated by this unit by introducing the class members to another unit such as the School or community helpers.
2. Use vocabulary words from the unit in oral activities and language games to help reinforce learning.
3. Use characters from this introductory unit in playing "Who Am I?" or "What Do I Do?" games.

VI. POSSIBLE MATERIAL AND EQUIPMENT NEEDS

A. Audio/Visual Materials
B. Audio/Visual Equipment
C. Books
D. Records
E. Record Player
F. Cassett Tapes
G. Recorder
H. Construction Paper
I. Art Paper
J. Poster Paper
K. Magic Markers
L. Scissors
M. Rulers
N. Glue
O. Masking Tape.
P. Crayons
Q. Chalk
R. Magazines
S. Newspapers
T. Butcher Paper
U. Tempera Paint
V. Paint Brushes
W. Socks
X. Paper Sacks
Y. Yarn
Z. Fabric Scraps
AA. Oatmeal Containers
BB. Buttons
CC. Spools
DD. Pipe Cleaners
EE. Paper Plates
FF. Cardboard Tubes
GG. Bulletin Board Materials
HH. Egg Cartons
II. Wooden Block
JJ. Flannel Board
KK. Cutout Figures
LL. Dolls
MM. Tools
NN. Simple Machines

VII. EVALUATION

A. SELF-EVALUATION

1. Did I attain all the goals I had set for myself as a teacher?
2. Did I plan effectively, utilizing methods and materials wisely?
3. Did I involve the youngsters to the maximum extent possible in planning and coordinating unit activities?
4. Did I incorporate all six (6) elements of the Career Development approach into the unit study?
5. Did I generate the maximum level of interest and participation through effective and reinforcing motivational activities?
6. Did I maintain a classroom atmosphere conducive to learning?
7. Did I plan adequately to include each child to the best of his ability?
8. Did I program activities so as to individualize instruction as much as possible?
9. Did I use the most effective means of correlating the subject matter?
10. Did I facilitate both individual initiative and group cooperation?

B. OBSERVATIONS OF THE CHILD

1. Evaluation of the first or second grade child will primarily be based on teacher observations. Some of these observations will be:
   a. Does he get right to work?
   b. Does he take part in class discussions?
   c. Can he work alone?
   d. How does he perform in a group?
   e. Does he enjoy the hands-on activities?
   f. Is he adept in language skills?
   g. Can he use a ruler effectively?
   h. Can he apply what he has learned?
   i. Does he enjoy working with others?
   j. Does he share?
   k. Does he clean up?
   l. Does he listen to the ideas of others?
2. Observe the flexibility of individual role interaction within the group.
3. Observe for evidences of strengthening of individual self-images.
4. Observe the student's use of communication skills both as an individual and as a member of the group.
5. Look for evidence of social interaction skills -- does the child accept responsibility willingly, complete tasks, share materials, take turns and communicate well with his peers?
6. Observe for any evidence of change in attitude toward school-related activities and the work community.

C. ORAL EVALUATION (PRE AND POST TEST IF DESIRED)

1. What is <u>work</u>? Do you do work at home or at school?

2. What is a job? Name some different jobs that you know.
3. What is a tool? How do people use tools in their work?

VIII. AUDIO/VISUAL AND RESOURCE MATERIALS

A. AUDIO/VISUALS

1. Films
   a. "Helpers Who Come to Our House"
   b. "Our Family Works Together"

   GEORGIA CATALOG OF CLASSROOM TEACHING FILMS, 1972-75.

   c. "Community Studies: Family"
   d. "People Who Work at Night"
   e. "Values: Cooperaton"

   BFA EDUCATIONAL MEDIA SANTA MONICA, CALIFORNIA

2. Filmstrips
   a. "Families in Action" (series)
   b. "My Mother Has a Job" (series)

   EYE GATE HOUSE JAMAICA, NEW YORK

   c. "The Family" (series)

   HOLT, RINEHART AND WINSTON ATLANTA, GEORGIA

   d. "Fathers Work" (series)
   e. "Mothers Work, Too" (series)

   IMPERIAL CHARLES CLARK AUDIO/VISUAL FARMINGDALE, NEW YORK

B. RESOURCE MATERIALS

1. Teacher Bibliography
   a. Davis and Ramsey, Investigating Communities and Cultures, New York: American Book Company, 1971.
   b. Grossman and Michealis, Working, Playing, Learning, San Francisco: Field Educational Publications, 1970.
   c. McIntire and Hill, Working Together, Chicago: Follett Publishing, 1965.
   d. Preston, Clymer, Fortess, Communities at Work, Lexington: D.C. Heath, 1969.
   e. Senesh, Lawrence, Our Working World -- Families at Work, Chicago: Science Research Associates, 1964.

2. Additional Resources
   a. Career Education Resource Guide, General Learning Corporation, New Jersey.
   b. Dictionary of Occupational Titles, U.S. Government Printing Office, Washington, D.C. 20402.
   c. Urban Panorama, National Dairy Council, Chicago, Illinois 60606.
   d. Occupational Outlook Handbook, U.S. Department of Labor, U.S. Government Printing Office, Washington, D.C. 20402.
   e. SRA Occupational Briefs, Science Research Associates, 259 East Erie Street, Chicago, Illinois 60611.

IX. CHILDREN'S BIBLIOGRAPHY

A. Carton, Larrie, Daddies, New York: Random House, 1963.
B. Caudill, Rebecca, Happy Little Family, HRT Incorporated, 1947.
C. Geeb, Donald, What Will I be From A to Z? National Dairy Council, 1972.
D. Hefflefinger and Hoffman, About Family Helpers, Los Angeles: Melmont Publishers.
E. Hoban, Russell, The Sorely Trying, New York: Harper and Row, 1964.
F. Merriam, Eve, Mommies at Work, New York: Scholastic Book Services, 1961.
G. Penn, Ruth, Mommies are for Loving, New York: Putnam, 1962.
H. Puner, Helen, Daddies and What They Do All Day, New York: Lothrop, Lee and Shephard, 1946.
I. Radlauer, Ruth, Fathers at Work, Los Angeles: Melmont, 1958.
J. Rosenbaum, Eileen, What Daddies Do, Kansas City: Hallmark, Inc.
K. Scarry, Richard, What Do People Do All Day? New York: Random House, 1968.
L. White and McDonald, Where I Live, Abingdon Press, 1967.
M. Zolotow, Charlotte, Big Brother, New York: Harper and Row, 1960.

COMMERCIAL AIRLINES AND AIRPORTS

Careers in Transportation

Grades 3 & 4

Teachers Resource Guide

INTRODUCTION TO THE AIRPLANE UNIT

Involving third and fourth grade students in an activity-centered unit related to airplane transportation is an effective means of presenting social studies concepts. The opportunity to "get involved" in planning and executing activities provided by the unit offers children a creative outlet for their energy. Field trips and resource persons provide enrichment experiences for many students and enhance ongoing classroom activities.

I. GOALS, OBJECTIVES AND CONCEPTS

A. TEACHER GOALS

1. To broaden the student's knowledge of himself and the work community.
2. To increase the student's knowledge of airplanes as one means of transportation.
3. To broaden the student's working vocabulary.
4. To provide the student real, manipulative and audio/visual learning experiences as well as abstract ones.
5. To stimulate the student's understanding of his individual contribution to the cooperative effort.
6. To help the student learn to function effectively on his own and as a member of the group.
7. To strengthen the student's decision-making skills by involving him in the decision-making process.
8. To help the student learn to identify and solve problems through critical thinking.
9. To stimulate the student's realization that all work roles are dignified deserve respect and contribute to a functioning society.
10. To give the student increased opportunities for identifying his self-characteristics.

B. LEARNER (BEHAVIORAL) OBJECTIVES

NOTE: These objectives may have to be adapted to fit the special abilities of individuals within a class.

1. By the end of the unit study, the learner will be able to recognize and pronounce a minimum of 75% of the vocabulary words introduced.
2. The learner will demonstrate his understanding of the vocabulary words by using them correctly in the context of written work and oral activities.
3. The learner will be able to relate a working definition of the term, airport and name a minimum of five (5) different major areas in the airport.
4. The learner will be able to identify five (5) major external parts of the airplane.
5. The learner will be able to list five (5) ways in which airplanes can be used.
6. The learner will be able to name at least five (5) work roles associated with the airport.
7. The learner will be able to describe some of the duties and work role characteristics associated with those five (5) work roles.
8. The learner will be able to construct a model airplane and/or a section of a model airport.
9. The learner will be able to name four (4) of the busiest airports in the United States.
10. The learner will be able to distinguish among the three (3) major types of airplanes, according to engine.

C. CONCEPTS

1. According to the American Heritage Dictionary, an aircraft is any machine or device, including airplanes, helicopters, gliders and dirigibles, capable of atmospheric flight.
2. An airport is said to be any tract of levelled land where aircraft can take off and land, usually equipped with hard-surfaced landing strips. a control tower, hangars and accomodations for passengers and cargo.
3. An airplane is able to fly as the result of the interaction of four (4) aerodynamic forces -- weight, lift, thrust and drag.
4. Different kinds of aircraft have been developed for specific purposes-- such as carrying passengers, hauling cargo, dusting crops, searching for and rescuing lost people, gathering information about the weather and aiding in map making.
5. Carrying passengers, cargo and mail is the primary job of commercial airlines which operate in approximately six hundred (600) United States Airports.
6. Having an airport often aids a community's growth since it permits easier accessibility and links the community more quickly with other parts of the country. Some cities own the airports and employ private firms to manage them.
7. Many different kinds of jobs are provided by an airport serving several airlines.
8. Major airports in large cities such as New York, Atlanta, Chicago and San Francisco are huge complexes of terminal buildings, ramps, control towers, hangars and runways.
9. Restaurant and motel facilities can be found in or around busy airports serving large numbers of passengers.
10. Many airports have a weather station that gathers meteorological information to share with pilots.
*11. An FAA control center may also be located in certain airports. The Federal Aviation Agency (FAA) is the government office that regulates overall aircraft operations, including air traffic control and airport facilities.
12. Passengers may arrive at the airport in their own cars, in airport limousines or by helicopter shuttle service.
13. Once at the airport, the passenger obtains a ticket from one of the airlines, checks his baggage and consults the schedule for his flight and gate departure information.
14. A passenger's baggage is checked, weighed and tagged to show its destination. Then it is sent to the loading area to be placed on the correct plane.
15. After checking his baggage, the passenger goes to the area of the of the airport (concourse) served by his airline to find his boarding lounge.
16. Recently instituted security measures require that passengers pass through a metal detection device and have their carry-on luggage and handbags searched.

*Stambler, Supersonic Transport

17. At the boarding lounge, the passengers has his ticket checked by the agent and waits to board the plane until called by the agent.
18. On board the plane, the passenger is directed by the steward or stewardess to either the first class or tourist section, depending upon the type of ticket.
19. A snack or soft drink is served to passengers on short flights, while more elaborate meals are served on long distance flights. Caterers at the airport prepare the meals and deliver them to the plane shortly before take-off. Once the plane is in flight, the flight attendants on board heat and serve the meals to the passengers.
20. Airplanes vary in engine (jet, prop and turbo-prop) and in size, which means that there may be as few as two (2) passengers and as many as three hundred (300) passengers.
21. In addition to the crew, passengers and luggage, a commercial passenger plane may also carry mail and small amounts of freight.
22. Some commercial planes carry only mail and cargo.
23. Major airlines serving Atlanta and the southeastern United States include Braniff, Delta, Eastern, Northwest Orient, Piedmont, Southern, Trans World Airlines and United.
24. The Air Traffic Control Towers are tall, glass-topped structures that enable the controllers to see approaching traffic from all directions. The controllers rely heavily on sophisticated electronic tracking equipment to keep up with the aircraft in their jurisdiction.
25. Each plane that lands or takes off from the airport must get clearance from the Control Tower.
26. Air traffic controllers are employees of the Federal Aviation Agency.
27. Airplane fuel is measured in pounds rather than in gallons.
28. Many different kinds of lights are used at an airport to help illuminate the runways.
29. Pilots attempting to land fly down a "radio slide" which is sent out by the instrument landing system. Radar is also used to help assist pilots in making safe landings.
30. Planes not being flown are parked in the hangar where mechanics inspect them and give them periodic overhauls.
31. Airplanes have increased the east of transportation and have facilitated the closer linking of different parts of the world.

II. SUBJECT MATTER

*A. DEFINITION OF KEY TERMS

1. Airplane: Any of various winged vehicles capable of flight, generally heavier than air and propelled by jet engines or propellers.
2. Airport: (a) A tract of levelled land where aircraft can take off and land, usually equipped with hard-surfaced landing strips, a control tower, hangars and accomodations for passengers and cargo; (b) A similar installation in which the landing area is on water.

*American Heritage Dictionary

3. Flight: The act or process of flying; locomotion through air by means of wings.
4. Transportation: (a) A means of transport; a conveyance; (b) the business of transporting materials, goods or the like.

B. SUGGESTED VOCABULARY TERMS

1. Airplane
2. Airport
3. Air Traffic Control
4. Baggage
5. Cargo
6. Characteristics
7. Commercial
8. Control Tower
9. Drag
10. Duties
11. FAA
12. Flight
13. Freight
14. Fuel
15. Fuselage
16. Gate
17. Hangar
18. Helicopter
19. Hijacker
20. Jet
21. Landing Gear
22. Lift
23. Military
24. Passenger
25. Private
26. Propeller
27. Rudder
28. Runway
29. Security
30. Tail
31. Terminal
32. Transportation
33. Thrust
34. Weight
35. Wing
36. Worker

C. HISTORY OF AIRPORTS

1. First airports were open fields -- cow pastures.
2. Airports after World War I.
3. Airports since World War II.

D. TYPES OF PLANES ACCORDING TO ENGINE

1. Prop
2. Jet
3. Turbo-prop

E. TYPES OF PLANES ACCORDING TO USE

1. Passenger
2. Cargo
3. Reconnaissance
4. Pleasure
5. Military
6. Weather
7. Medical
8. Agriculture

F. MAJOR EXTERNAL PARTS OF AN AIRPLANE

1. Rudder
2. Elevator
3. Skin
4. Props

5. Fuselage
6. Tail
7. Wings
8. Flaps
9. Landing Gear
10. Nose
11. Engine

G. TYPES OF AIRPORTS

1. Commercial
2. Private
3. Helicopter
4. Military
5. Landing Strip

H. DIFFERENT AREAS OF THE AIRPORT

1. Main Terminal
2. Ticket and Information Counters
3. Concourse
4. Security Station
5. Ramps
6. Boarding Lounges
7. Service Areas
8. Gates
9. Management Offices
10. Baggage Claim
11. Control Tower
12. Runways
13. Approach
14. Hangars
15. Parking Lots

I. TEN OF THE BUSIEST AIRPORTS IN THE UNITED STATES

1. Chicago -- O'Hare
2. New York -- John F. Kennedy
3. Atlanta -- Hartsfield International
4. Los Angeles
5. San Francisco
6. Miami
7. Washington, D.C.
8. New York -- La Guardia
9. Boston
10. Newark, New Jersey

III. OCCUPATIONAL INFORMATION

*A. GENERAL DESCRIPTION

"The rapid development of air transportation in the past two (2) decades has increased the mobility of the population and has created many thousands of job opportunities in the civil aviation industry." Of these thousands of new jobs, the largest percent was employed to fly and service aircraft and passengers on the domestic routes between cities in the United States. Smaller percentages of workers were involved in the operation of airlines flying the international routes. In addition to the commercial and private airlines, the Federal government employed many workers in various capacities in different regulatory and investigative capacities.

B. JOB ENTRY AND PREPARATION

Skills, education, training and personal qualifications vary with the different positions in the aviation industry. For instance, a pilot must be licensed by

*Occupational Outlook Handbook

FAA and must have an instrument rating, must be at least eighteen (18) and have two hundred (200) hours flight experience. This flight experience and training may be gained from military service or from private instruction.

Stewards and stewardesses are required to be high school graduates. Any college or work experience is helpful for applicants interested in such a position. Most airlines conduct their own in service training for stewards and stewardesses.

For mechanics and flight technicians, FAA licensing is also required. To obtain a license, a mechanic must be a graduate of an approved school and/or have a minimum amount of experience. Military service in this field is also accepted as valid experience.

C. GENERAL REQUIREMENTS

For many of the workers in the aviation industry, a basic education, general ability, the ability to deal effectively with the public and the ability to work under sometimes less than ideal conditions are sometimes necessary.

Other characteristics -- the ability to work with data, manual dexterity, an eye for details may be associated with particular occupations.

D. WORK ROLE CHARACTERISTICS AND CONDITIONS

Work roles in this occupational area may be classified under the headings of being involved primarily with people, data or things. For example, flight attendants are chiefly concerned with passengers and their needs; the reservationist is primarily occupied with data -- fact and figures related to schedules; and baggage handlers are concerned with luggage and cargo.

Depending upon the particular work role, some night, weekend and holiday work might be involved since planes operate on twenty-four (24) hour a day, (7) day week scheduling.

Noise and outside work are factors encountered by mechanics baggage handlers and flight technicians. Safety is a factor to be considered by in-flight personnel. Stress and the pressure of being responsible for many planes are characteristics of the air traffic controller's job.

Many workers in the aviation industry wear uniforms and other special clothing. Some belong to unions which help to protect workers' rights with the airlines. More and more of the jobs formerly held only by men (pilot, mechanic, dispatcher) are becoming open to qualified women. Also, more men are being employed as flight attendants, especially on long domestic

or foreign flights.

E. CAREER LISTINGS

1. Ground Personnel

a. Air Traffic Controller
b. Traffic Dispatcher
c. Radio Operator
d. Meteorologist
e. Dispatch Clerk
f. Teletypist
g. Travel Agent
h. Information Clerk
i. Reservationist
k. Airport Administrator
l. Secretary
m. Food Service Personnel
n. Custodial Personnel
o. Security Workers
p. Baggage Handler
q. Freight Carrier
r. Mechanic
s. Flightline Technician
t. Porters
u. Shuttle Bus Driver
v. Clerical Workers
w. Parking Attendants
z. FAA Inspector

2. IN-FLIGHT WORKERS

a. Flight Attendants
b. Pilot
c. Co-Pilot
d. Flight Engineer

IV. SUGGESTED MOTIVATION ACTIVITIES

A. Encourage students to bring in small models of various kinds of aircraft to display in the classroom. Use the display to stimulate a discussion of the kinds of aircraft and their different uses.

B. Select and show an interesting film or use another audio/visual aid to stimulate student interest. The films "Airplanes Work for Us," (Georgia Catalog) or "Airplanes," (BFA Educational Media) are possible choices.

C. Motivate students through a discussion of their own experiences related to airlines and air transportation. Question students to determine how many have flown on a plane or visited an airport and encourage these students to share their experiences with others.

D. Try to find an interesting book or story related to the unit topic to read to the students.

E. Obtain pictures, posters, travel brochures and other colorful materials from various airlines and other sources to use in designing and constructing an attractive bulletin board.

F. Invite a resource person (Stewardess, Pilot, Flight Technician, FAA Supervisor, Reservationist, Ticket Agent, etc.) to visit the class to share ideas and feelings with the students in a discussion session. Follow up the visit with a time for

"talking it over" in which youngsters are encouraged to verbalize their thoughts and reactions.

G. Correlate an art activity (drawing, sketching, painting) with the unit theme to create student interest.

V. SUGGESTED STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Begin motivational activities and use throughout the unit to stimulate and maintain student interest.
2. Introduce the unit topic by defining appropriate vocabulary in student terms. Involve students in helping to define the terms.
3. Use the questions, "What is the airport? Who works there? How does the airport help us? How can we find out more about the airport and airplanes?" to guide a discussion of the unit. Involve students in setting directions, making lists of ideas for activities, possible resource persons and field trip sites and identifying needed materials and equipment. Use the lists in formulating plans.
4. Assess levels of student knowledge and interest by giving an interest inventory, pre-test or expectations sheet. Keep records of the results to compare with those from the end of the unit.
5. Start a class scrapbook of newspaper clippings, stories, snapshots, magazine pictures and other material related to the unit. Keep the materials in chronological order so as to tell the sequential story of the unit development.

B. RESEARCH ACTIVITIES

1. Take the entire class to the media center to identify and explore some of the resources available for research purposes. Gather some materials (film loops, cassette tapes, study prints, books, magazines, etc.) for classroom research center.
2. Encourage students to utilize the available resources in looking for information on the unit topic. Have them work individually or in small groups (2 - 5 students) to do research on themes of interest to them. (Different types of aircraft and their uses, the history of airplanes and helicopters, facts about the first commercial passenger flight, development of different airlines, aviation work roles and their characteristics, etc.)
3. Student work groups could be involved in beginning work on different types of "tangible evidence" for the classrooms. They could include such things as:
   a. Chart of pictures of different aircraft.
   b. Lists of vocabulary words and definitions.
   c. List of work roles identified and some of their characteristics.
   d. List of United States' ten (10) busiest airports.
   e. Diagram of a typical airport with major areas identified.

f. Diagram of an airplane with the major external parts identified.
g. List of airplanes according to engine type.
h. List of airplanes and their uses.
i. Models of different kinds of aircraft.
j. List of major commercial airlines.
k. List of properties of air affecting airplane transportation.

4. Utilize a resource person in helping the students gather information about aviation work roles, characteristics, feelings, duties, etc.
5. Incorporate other audio/visual aids into the unit of study. "An Airplane Trip by Jet," or "Airport in the Jet Age," (Georgia Catalog) might be useful films. The set of slides, "Airport Workers" (Society for Visual Education) might also be helpful.
6. Plan a field trip to site in the community, using the Yellow Pages of Learning Resources as a guide in developing plans and questions for the trip.
7. Begin work on hands-on activities of building a model airport or control tower.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Reinforce vocabulary learning through the introduction of new words. Use the new words in oral and written activities such as games, crossword puzzles, reports and compositions.
   b. Help the class to develop an interview format for use with resource people and workers encountered on field trips. Have them practice their oral skills by interviewing other students role playing as aviation workers.
   c. Make a reading table of library titles and paperbacks related to the unit. Encourage students to make selections from those books.
   d. Dramatize various incidents from the aviation industry, using role playing techniques to illustrate them. Students might be interested in depicting an airplane flight from beginning to end, including the operations of the control tower and other ground personnel.
   e. Use role playing techniques to help students experience and understand the need for cooperation and the need for each person's contribution to the group effort. Dramatize incidents such as might happen if the air traffic controller, pilot, stewardess, custodian, or security guard failed to do their jobs.
   f. Have students write letters to firms to request information and materials.
2. Mathematics
   a. Stimulate a discussion of the applications of various math skills to work activities in the aviation industry. Talk about the uses of measuring, estimating, computing, enumerating and averaging skills in various activities.

b. Give students practice in reading large, multi-place figures taken from the aviation industry. Gather figures from total passengers carried, total air miles logged and numbers of flights made per year and have students read them aloud.

c. Introduce the concept of rounding and relate it to figures taken from the total numbers of passengers, total numbers of air miles logged, numbers of flights made, etc. Have youngsters practice rounding these figures to the nearest hundred and thousand.

d. Utilize all computation skills (addition, subtraction, multiplication, division) in solving problems. Sample problems might include computing total numbers of passengers; computing the distance a plane will travel in a given time at an average speed; averaging the speed per trip or amount of air time; computing numbers of meals served for passengers; computing revenues from ticket sales, etc.

e. Incorporate linear measuring skills into hands-on activities of laying out a model airport or making items for use in role playing activities.

*f. As a motivational strategy to encourage interest and participation in math, devise a game to illustrate advancement. On one section of the bulletin board, post a map to illustrate a distance to be covered. Designate a starting and ending point and let each student make an "airplane" to represent his progress. Devise certain activities to be completed to cover a certain distance and have each student keep track of moving his "plane" to record his progress in math skills.

g. Introduce set theory terms by defining them in terms of the unit topic.

3. Science

**a. Introduce the properties of air -- mass, weight, pressure and movement -- and illustrate these principles by devising some simple experiments. To illustrate the principle of pressure, drop a sheet of paper to the floor and observe the way it glides to the floor. Then crumble the same sheet of paper into a loose ball and drop it; next, crumple the sheet into a smaller, tighter ball and drop it -- it will fall faster and in a straighter line.

***b. To demonstrate that air has weight, take a glass tumbler of water full to the brim, place a piece of cardboard or stiff paper over the top and hold it there. Quickly turn the glass upside down and remove your hand. The card will stay in position and the water will not fall out of the glass.

c. Discuss with the students the four (4) forces -- weight, drag, thrust, lift -- that interact to make airplanes fly. Get some simple books that have illustrations of these forces in operation. An audio/visual aid would be helpful in this activity.

* Roberta Jackson - Brown Elementary

** Corbett, What Makes A Plane Fly?

*** Aviation Research Associates, How Planes Fly

d. Discuss with the students the importance of weather and atmospheric conditions in aviation. Talk about the role of the weather service at the airport in altering pilots and crews as to weather conditions. Identify some of the tools and instruments used by aviation meteorologists.

4. Social Studies
   a. Introduce the idea that the airplane serves to link different parts of the country and the world. Compare and contrast the airplane as a means of transportation with present and former types of transportation.
   b. Talk with the students about the uses of maps and the skills of map-reading related to the aviation industry. Post a large map of the United States and try to trace some of the major routes used by airlines. Also, use a globe to point out international routes.
5. Art.
   a. Use various materials in designing and constructing a model airport in one area of the classroom.
   b. Have the students do individual sketches of different types of aircraft, including their versions of future ones. Also, students could do drawings of workers.
   c. Involve youngsters in designing advertising posters for the various "airlines" they may set up in the classroom.
   d. Interest the students in drawing a large mural of the diagram of a typical large airport. Or, students could do drawings of activities found at the airport.
   e. Some youngsters might be interested in making puppets from paper bags, pipe cleaners, construction paper, yarn, etc. These puppets could represent various aviation workers.

D. SUGGESTED HANDS-ON ACTIVITIES
1. Involve students in designing and constructing a scale model airport, with towers, hangars, terminals, runways, ramps, etc. Use materials such as cardboard boxes, construction paper, aluminum foil and plastic and layout the airport on a large table top or on a sheet of plywood. While the students are constructing the airport, have them discuss the different areas of the airport and the people who work there.
2. Have students make items to use in role playing activities. A control tower could be built from a refrigerator box; a cockpit from cardboard and poster board; an information viewer from a grocery carton; a pilot's uniform from an old shirt, etc. Encourage students to work individually or in small groups to design and make these items.
3. Some students might wish to construct models of different types of aircraft from kits, from plastic or balsa wood.

E. SUGGESTED CULMINATING ACTIVITIES
1. Plan and take a field trip to Hartsfield International Airport in Atlanta, if possible, using the Yellow Pages of Learning Resources in helping to make

preparations for the trip. Follow up the trip with a time for "talking over" what the students felt and observed.

2. Use a game or crossword puzzle to assess students' understanding of vocabulary terms.
3. Display finished art projects in the classroom.
4. Provide students materials to design and make a final bulletin board on the airport or other interesting aspects of the unit.
5. Involve another resource person in the activities of the students.
6. Complete role playing activities of dramatizing a plane flight from beginning to end. Involve all students in the activity, encouraging them to interchange roles to get a broader range of experiences.
7. Show any other particularly interesting films or filmstrips related to the airport.
8. Give the final questionnaire, post-test or expectations sheet to assess student's knowledge and interest levels. Compare results with initial evaluation.

F. FOLLOW-UP ACTIVITIES

1. Plan a summarizing oral evaluation session and involve students in verbalizing their reactions to unit activities. Encourage them to talk about their roles, ways projects and activities could have been improved, "high" and "low" points of the unit, etc.
2. Continue to use new vocabulary terms and definitions in oral and written work to help reinforce learning.

VI. MATERIAL AND EQUIPMENT NEEDS

A. Shoe Boxes
B. Cardboard Sheets
C. Egg Cartons
D. Crepe Paper
E. Cardboard Tubes
F. Gravel
G. Construction Paper
H. Modeling Clay
I. Paper Bags
J. Pipe Cleaners
K. Yarn
L. Buttons
M. Poster Paper
N. Magic Markers
O. Scissors
P. Rulers
Q. Refrigerator Box
R. Exacto Knives
S. Butcher Paper
T. Tempera Paint
U. Paint Brushes
V. Crayons
W. Art Paper
X. Globe
Y. United States Map
Z. Glass
AA. Aluminum Foil
BB. Brochures and Pamphlets
CC. Library Books
DD. Dictionary
EE. Paper and Envelopes
FF. Audio/Visual Materials
GG. Audio/Visual Equipment
HH. Bulletin Board Supplies
II. Magazines
JJ. Newspapers
KK. Camera and Film
LL. Masking Tape
MM. Model Airplanes
NN. Glue

VII. EVALUATION

A. SELF-EVALUATION

1. Did I attain all the goals I had set for myself as a teacher?
2. Did I incorporate all six (6) elements of the Career Development approach into the unit study?
3. Did I involve all youngsters to the maximum extent possible in the planning and coordinating of unit activities?
4. Did I plan effectively, utilizing methods and materials wisely?
5. Did I generate the maximum level of interest and participation through effective and reinforcing motivational activities?
6. Did I encourage students to verbalize their feelings and reactions following role playing activities?
7. Did I maintain a classroom atmosphere conducive to learning?
8. Did I use the most effective means of correlating the subject matter?
9. Did I facilitate expressions of both individual initiative and group interest?
10. Did I plan activities so as to individualize instruction as much as possible?

B. OBSERVATIONS OF THE CHILD

1. Observe the flexibility of individual role interaction within the group.
2. Observe for evidence of individual research and task completion.
3. Observe for evidences of strengthening of individual self-images.
4. Observe the youngster's ability to apply his abstract knowledges to concrete learning situations.
5. Observe the student's use of communication skills both as an individual and as a member of the group.
6. Look for evidence of social interaction skills -- does the child accept responsibility willingly, complete tasks, share materials, take turns and communicate well with his peers?
7. Observe for any evidence of change in attitude toward school-related activities and the work community.

C. WRITTEN EVALUATION (PRE AND POST TEST IF DESIRED)

1. Match the word in the left column with its correct meaning in the right. Write the letter of the correct meaning in the blank beside the word.

_____ Transportation	A. Act of flying
_____ Flight	B. Area of land where aircraft can take off and land.
_____ Airport	C. Winged vehicle able to fly.
_____ Airplane	D. Means of getting around.

2. Name as many work roles as you can that are related to airlines and the airport.
3. How do these workers help us?
4. What are some of the different ways that airplanes can be used?

D. ORAL EVALUATION QUESTIONS

1. How many commercial airports are there in the United States?
2. List five (5) ways that an airport adds to the progress of a community.
3. What are jetways?
4. How many jobs does an airport provide for people?
5. How does a passenger know when to board his plane?
6. How many passengers can an airplane carry?
7. Why are Air Traffic Control Towers the highest part of the airport?
8. Who prepares meals for an airline?
9. How is airplane fuel measured?
10. What is a "radio slide"?
11. Name five (5) occupations at an airport.
12. Name four (4) workers on an airplane.
13. Name three (3) kinds of airplanes.

VII. AUDIO/VISUAL AND RESOURCE MATERIALS

A. AUDIO/VISUAL

1. Films
   a. "Airplanes Work for Us"
   b. "Airport in the Jet Age"
   c. "An Airplane Trip by Jet"
   d. "Billy's Helicopter Ride"
   e. "Jetliner Captain"

GEORGIA CATALOG OF CLASSROOM TEACHING FILMS, 1972-75.

   f. "Airplanes"
   g. "Airport"
   h. "Helicopter Helpers"

BFA EDUCATIONAL MEDIA SANTA MONICA, CALIFORNIA

   i. "Plane Talk"

SOUTHERN BELL EDUCATION FILMS ATLANTA, GEORGIA

2. Filmstrips
   a. "A Visit to the Airport"

EDUCATIONAL ACTIVITIES, INC. FREEPORT, NEW YORK

   b. "Careers in Aerospace" (Series)

EYE GATE HOUSE JAMAICA, NEW YORK

3. Slides
   a. "Airport Workers"

SOCIETY FOR VISUAL EDUCATION CHICAGO, ILLINOIS

B. RESOURCE MATERIALS

1. Teacher Bibliography
   a. Corbett, Scott, What Makes a Plane Fly?, Boston: Little Brown and Company, 1967.
   b. Floherty, John, Aviation From the Ground Up, Philadelphia: Lippincott, 1950.

c. McFarland, Kenton, Airplanes -- How They Work, New York: Putnam's Sons, 1966.
d. Stambler, Irvin, Supersonic Transport, New York: Putnam's Sons, 1965.
e. Taylor, John, Aircraft, New York: Crossett and Dunlap, 1972.

2. Additional Resources
a. Air Travel Materials, Cessna Aircraft -- Ed. Division, P.O. Box 152, Wichita, Kansas 67201.
b. Air World Educational Series, Trans-World Airlines, Inc., 605 3rd Avenue, New York, New York 10016.
c. "Aviation -- Where Career Opportunities are Bright", National Aerospace Education Council, 806 15th Street, N.W., Washington, D.C. 20005.
d. Career World, (Vol. I, Number 4) 1972, Curriculum Innovations, Highwood, Illinois.
e. Costello and Wolfson, Concise Handbook of Occupations, Chicago: Ferguson, 1971.
f. Dictionary of Occupational Titles, U.S. Government Printing Office, Washington, D.C. 20402.
g. Federal Aviation Agency, Department of Transportation, P.O. Box 25082, Oklahoma City, Oklahoma 73125.
h. Occupational Outlook Handbook, U.S. Government Printing Office, Washington, D.C. 20402.
i. SRA Occupational Briefs, 259 E. Erie Street, Chicago, Illinois 60611.
j. Yellow Pages of Learning Resources, M.I.T. Press, Cambridge, Massachusetts.

3. Airline Addresses
a. American Airlines, Inc., 633 Third Avenue, New York, New York, 10017.
b. Beech Aircraft Corp., Public Relations Department, 9709 E. Central, Wichita, Kansas 67201.
c. Boeing Company, Attn: Public Relations, P.O. Box 3707, Seattle, Washington, 98124.
d. Cessna Aircraft Company, P.O. Box 1521, Wichita, Kansas 67201.
e. Delta Airlines, Inc., Public Relations Department, Atlanta Airport, Atlanta, Georgia, 30320.
f. Lockheed Aircraft Corp., 2555 N. Hollywood Way, Burbank, California 91503.
g. McDonnell Douglas Corp., Director of Public Relations, 3000 Ocean Park Boulevard, Santa Monica, California 90406.
h. Piper Aircraft Corp., Lock Haven, Pennsylvania 17745.
i. Trans World Airlines, Inc., Director, Public Relations, 605 3rd Avenue, New York, New York 10016.
j. United Airlines, Inc., P.O. Box 66100, O'Hare International Airport, Chicago, Illinois 60666.

IX. STUDENT'S BIBLIOGRAPHY

A. American Heritage Magazine, The History of Flight, Golden Press, 1966.
B. Bendick, Joanne, First Book of Airplanes, Franklin Watts, 1958.
C. Donovan, Jere, Wings in Your Future, Harcourt, Brace, & Co., 1953.
D. Feravolo, Roco, V., Junior Science Book of Flying, Sarrard Press, 1960.
E. Greene, Carla, I Want to be an Airplane Hostess, Children's Press, 1960.
F. Gottlieb, William F., Aircraft and How They Work, Garden City Books, 1960.
G. Hyde, Margaret O., Flight Today and Tomorrow, McGraw, 1962.
H. Loomis, Robert D., All About Aviation, Random House, 1964.
I. Ress, Etta Schneider, Transportation in Today's World, Creative Educational Society, 1965.
J. Stanek, Muriel, I Know an Airplane Pilot, G. P. Putnam's Sons, 1969.

TRAINS

Careers in Transportation

Grades 3 & 4

Teachers Resource Guide

INTRODUCTION TO THE TRAIN UNIT

The railroad industry, as one segment of the transportation cluster, offers many possibilities as a unit topic on the third and fourth grade level. Subject Matter concepts, especially in the area of social studies, are enhanced by their presentation through the unit framework. Different types of learning experiences are created by the unit topic, which capitalizes on the students' interest and developing abilities.

I. GOALS, OBJECTIVES AND CONCEPTS

A. TEACHER GOALS

1. To help the student learn more about himself and the work community.
2. To introduce the student to the train as one means of transportation.
3. To give the student more opportunities for working in a group experience.
4. To enrich the student's working vocabulary.
5. To provide the student real, manipulative and audio/visual learning experiences as well as abstract ones.
6. To strengthen the student's decision-making abilities by involving him in decision-making situations.
7. To broaden the base of the student's experiences by incorporating content and skills into activity-centered learning situations.
8. To stimulate the student's understanding of the need for individual responsibility in the cooperative effort.
9. To help the student develop his verbal skills.
10. To stimulate the student's respect for individuals and their work roles.

B. LEARNER (BEHAVIORAL) OBJECTIVES

NOTE: These objectives may have to be adapted to fit the special abilities of individuals within a class.

1. By the end of the unit study, the learner will be able to recognize and pronounce at least 75% of the vocabulary words introduced.
2. The learner will be able to relate a working definition of the terms, train and railroad.
3. The learner will be able to name at least five (5) different work roles associated with the railroad. Also, he will be able to describe orally some of the duties and characteristics of the five (5) roles.
4. Given pictures of railroad workers, the learner will be able to identify at least 75% of them by correct work role titles.
5. The learner will be able to identify the two (2) main types of trains according to their pincipal use -- passenger and freight.
6. The learner will be able to name three (3) ways in which trains help different businesses.
7. The learner will be able to name at least four (4) different types of railroad cars and describe their uses.
8. The learner will be able to match different cargoes with appropriate types of freight cars.
9. The learner will be able to identify three (3) different types of engines.
10. The learner will be able to explain briefly why whistles are needed on trains.

C. CONCEPTS

1. Used to transport passengers, cargo and mail, a train is a string of

connected railroad cars pulled by an engine.

2. Some trains carry mainly passengers, some transport mostly freight while others carry both passengers and freight.
3. Different kinds of railroad cars are used for different purposes. Some carry people, some are restaurant cars and others are sleeping (Pullman) cars. Freight cars are built for specific purposes -- some haul livestock, others oil and petroleum products, others steel and metal products, etc.
4. To facilitate transportation of goods, the "piggy-back" system was developed. In this system, loaded trailer trucks are hauled from city to city on railroad flat cars to shorten their travel time.
5. Trains operate on single rails (monorail) and on double rails.
6. To serve their customers better, trains operate on time schedules to do a more efficient job of transporting people and freight.
7. A railroad time-table gives information about arrival and departure times.
8. Railroad stations add to the convenience of rail travel.
9. An engine is also known as a locomotive because it can move from place to place under its own power.
10. Most locomotives now have diesel engines.
11. The last car on the frieght train is known as the caboose and it is usually red. It serves as the home of the train crew while they are on the road.
12. "Safety First" is the motto of the railroads and railroad workers.
13. Signals and lights play an important role in railroad operations.
14. Trains communicate by means of whistles and signals.
15. England is known as the home of the railroad since most early trains were developed there. Steam was used to propel these early trains.
16. The first steam locomotive to run on track in America was built by Colonel John Stevens in 1825.
17. These early locomotives were refined and developed into an effective efficient means of transportation that aided the growth of America.

II. SUBJECT MATTER

A. DEFINITION OF KEY TERMS*

1. Railroad: (a) A road composed of parallel steel rails supported by ties and providing a track for locomotive-drawn trains and other rolling stock. (b) The entire system of such track, together with the land, stations, rolling stock and other property used in rail transportation.
2. Train: A string of connected railroad cars.
3. Transportation: (a) a means of transport; a conveyance. (b) The business of transporting passengers, goods, materials, or the like.

B. SUGGESTED VOCABULARY TERMS

1. Baggage
2. Boiler
3. Boxcar
4. Caboose

*AMERICAN HERITAGE DICTIONARY

5. Cowcatcher
6. Diesel
7. Electric
8. Engine
9. Express
10. Mail
11. Freight
12. Passenger
13. Pullman
14. Safety
15. Steam
16. Train
17. Transportation
18. Travel
19. Whistle
20. Worker

C. EARLY HISTORY OF TRAINS

1. 1814 – George Stephenson, an Englishman, built a working steam locomotive.
2. 1825 – Colonel John Stevens built first steam locomotive to operate in America.
3. 1830 – An American, Peter Cooper, built the "Tom Thumb," a famous steam engine.
4. 1830 – Scheduled steam railroad service began in America.
5. 1830 - 1860 – Railroads expanded across America.
6. 1896 – Central Pacific and Union Pacific Railroads met to form first transcontinental system.

D. DIFFERENT TYPES OF TRAINS

1. Passenger
   a. Many people use trains to commute between home and work, especially near large cities.
   b. These trains may operate shorter distances.
   c. Other trains may operate longer distances and be used for other purposes that commuting.
2. Freight
   a. This type of train is concerned with transporting various types of goods.
   b. This service is very valuable to the railroad and other businesses.
   c. Freight is carried in many different types of cars.
   d. Some of the freight cars are express; that is, they are separate ones that travel fast and give door-to-door pick-up and delivery service.
   e. A great percentage of the United States mail is shipped on special mail cars or on special mail trains.

E. DIFFERENT KINDS OF RAILROAD CARS

1. Passenger Cars
   a. Coache
      (1) Has individual seats with adjustable backs.
      (2) Has baggage racks for small luggage.
      (3) Built with wide windows for better viewing of scenery.

b. Parlor
   (1) Known as the "Living room" of the train.
   (2) Contains comfortable chairs and couches.

c. Pullman
   (1) Is the quietest, most sound proof car of the passenger train.
   (2) Is the car in which passengers sleep.

d. Club and Lounge
   (1) Usually located near the center of train.
   (2) Used for recreation and relaxation.

e. Baggage
   (1) Carries Luggage.
   (2) Carries passengers' pets.

f. Mail Car
   (1) Carries mail from place to place.
   (2) Picks up mail in large cities.

2. Freight

a. Boxcar
   (1) Completely housed in with sides, ends and roof.
   (2) Has a large sliding door on each side.
   (3) Used to carry grain, flour, dried, canned and packaged goods.
   (4) Made of wood or metal.

b. Flatcars
   (1) Platforms mounted on wheels.
   (2) Used to transport lumber, heavy machinery and other bulky materials.

c. Livestock
   (1) Side walls are slatted for ventilation.
   (2) Used for shipment of cattle, horses, mules, sheep, hogs, goats, and etc.

d. Hopper or Open Top
   (1) Usually all steel.
   (2) Has doors at bottom of car for dumping contents.
   (3) Used for transportation of coal, sand, gravel.

e. Tank
   (1) Round steel tanks lined with metal or galss.
   (2) Used for shipment of crude oil, fuel oil, gasoline, kerosene, and other liquids.

f. Refrigerator Cars
   (1) Look like boxcars.
   (2) Have insulated walls, floor and roof.
   (3) Used to transport fresh fruits, vegetables and flowers.

g. Caboose
   (1) At the end of every freight car.
   (2) Office of the conductor.
   (3) Traveling home of the freight crew.

F. DIFFERENT KINDS OF ENGINES

1. Electric
   a. Runs by an overhead electric wire connected to the engine.
   b. Has no smokestack.
2. Diesel Electric
   a. Burns fuel oil.
   b. Wheels turned by electricity generated by burning fuel.
3. Steam
   a. Has a boiler where a steam is made to make the train go.
   b. Has a big smokestack.

G. PARTS OF THE ENGINE

1. Cowcatcher
   a. Metal frame on the front of the train to remove obstructions from the tracks.
   b. Aids in clearing snow from the tracks .
2. Boiler
   a. Tank where water is turned into steam for power.
   b. Steam from boiler causes the train to move.
3. Bell
   a. Sometimes located on top of the engine.
   b. Fireman rings the bell.
4. Headlights
   a. One large beam of light located on the front of the engine.
   b. Usually electric or gas.

H. LOCOMOTIVE WHISTLES AND THE LANGUAGE THEY SPEAK

1. Short toot of the whistle means that the train is stopping.
2. Two (2) long toots mean that the train is starting to move.
3. One (1) very long toot means that the train is nearing the railroad station.
4. Several short toots is an alarm for persons or livestock on the track.

III. OCCUPATIONAL INFORMATION AND DESCRIPTION*

A. GENERAL DESCRIPTION

One of the nation's largest employers is the railroad industry which needed more than 500,000 workers in 1970 to operate trains, maintain and repair facilities and do other vital jobs. Workers are employed in every State except Hawaii and in both small towns and large cities.

Because of the decline of passenger service, the largest numbers of workers are involved in the transporting of freight. Basically, railroad work duties could be divided into five (5) main groups: (1) train operations; (2) communications and clerical functions; (3) building and maintenance of rolling stock; (4)

building and maintenance of track and other structures and (5) passenger services.

B. JOB ENTRY AND PREPARATION

For the greatest percentage of jobs, on-the-job training is given. A basic education and general ability will prepare a person to enter most jobs in the railroad industry. Once a person is employed, he may work at several different positions to gain experience before being assigned to a specific post.

Some workers are placed in apprenticeship programs to learn skills and to gain experience.

Additional experience and seniority enable the worker to enter new positions.

C. GENERAL REQUIREMENTS

A high school education or its equivalent, good physical condition, excellent hearing and eyesight, manual dexterity, and reliability are necessary attributes of all workers in the railroad industry.

D. WORK ROLE CHARACTERISTICS AND CONDITIONS

Work role characteristics may vary widely from work role to work role within the railroad industry. Like other industries within the transportation cluster, railroad work roles may be described as dealing primarily with people, information or things. For instance a railroad conductor might have extensive personal contact with passengers; clerks might deal with large volumes of information and shop workers may deal principally with pieces of machinery and equipment.

Some night, holiday and weekend work will be involved for certain railroad workers. Beginners often receive the night shifts and unpopular assignments while other workers with more seniority get better conditions.

For the yard worker, brakeman and other personnel, outdoor work may be characteristic of the job. Other personnel may have primarily indoor work or a combination of the two.

Most workers in the railroad industry are men. The small percentage of women employed work mostly in the offices.

* OCCUPATIONAL OUTLOOK HANDBOOK

E. SAMPLE CAREER LISTINGS AND DESCRIPTIONS

1. Station Workers
   a. Agent
      (1) Arranges specially conducted tours.
      (2) Promotes special events such as baseball and football trips.
   b. Ticket Seller
      (1) Sells tickets.
      (2) Must be honest and dependable.
      (3) Keeps records of the tickets sold.
   c. Clerk
      (1) Gives needed information to the passengers before they buy tickets.
      (2) Gives suggestions to people planning vacations.
   d. Porter
      (1) Helps the passengers on and off the trains.
      (2) Assists them with their luggage.
      (3) Is always courteous and helpful.
      (4) Is sometimes known as a "redcap."

2. Train workers
   a. Engineer
      (1) Drives the locomotive.
      (2) Assumes responsibility for train's proper operation.
   b. Fireman
      (1) Assists the engineer.
      (2) Rings the bell and the whistles.
      (3) Looks after the heating, lighting and air conditioning.
      (4) Oils parts of the engine.
   c. Brakeman
      (1) Operates warning lights and red flags.
      (2) Couples and uncouples the cars.
   d. Conductor
      (1) Is in charge of the train.
      (2) Collects tickets from passengers.
      (3) Calls out approaching stations.
   e. Stewardess
      (1) Sees that everyone is comfortable in the passenger cars.
      (2) Brings passengers pillows and magazines, etc.
      (3) May be a registered nurse.
   f. Pullman Porter
      (1) Prepares the berths for the passengers at night.
      (2) Sees that sleeping cars are in order.
   g. Cooks
      (1) Prepares all the meals served on the train.
      (2) Must be well trained in food preparation.

h. Waiter
   (1) Assists the passengers in the selection of their meals.
   (2) Places the passengers' orders with the cook.

IV. SUGGESTED MOTIVATION ACTIVITIES

A. Plan and decorate an attractive bulletin board related to transportation, focusing on the railroad as one means of transportation. Use newspaper, magazine or commercial pictures in the display.

B. Encourage several students to bring in pieces of equipment to set up a model train in one area of the classroom. Use the display to spark interest in a discussion, using such questions as: What is a train, exactly? How do trains help us? Who are the people who work on the train? What do they do? How does the train compare to other forms of transportation?

C. Use an audio/visual aid to give students an overview of the transportation cluster. "Transportation: Footpath to Air Lane," (Churchill Films) or "Transportation: Our Railroads," (Imperial Films) might be suitable choices.

D. Lead students in a discussion of their experiences related to trains. Have them describe their experiences of riding a train; visiting a train yard or train station; talking with parents, friends or relatives who work for the railroad, etc.

E. Gather some interesting books related to the unit topic. Display them on a reading table in the classroom and call the students' attention to the books.

F. Involve a resource person (engineer, brakeman, yard manager) in the class activities. Use the visitor's sharing of experiences, feelings and ideas to generate interest in the students.

V. SUGGESTED STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Begin motivation activities and use throughout the unit to stimulate and maintain student interest.
2. Introduce the unit topic by defining key terms in student language. Then, involve the students in discussing the possible directions the unit might take and in making plans, identifying areas of interest and possible activities, determining possible material and equipment needs, etc.
3. Assess students' knowledge and interest levels by devising and giving a brief pre-test, questionnaire, interest inventory or expectations sheet. Keep records of the results to compare with post-unit evaluations.

4. Plan a class visit to the library to identify possible resources for use in unit activities. Involve students in collecting library books, magazines, paperbacks, pamphlets, pictures, textbooks, newspaper articles and other materials for a classroom media center.
5. Outline plans for roleplaying and hands-on activities and begin getting together needed tools, equipment and materials. Students' working in small groups (2-5 children) could handle responsibilities very effectively.

B. RESEARCH ACTIVITIES

1. Outline topics for individual and small group research projects. Some areas of interest might include: trains of then and now; interesting jobs on the train; different types of train engines; uses of trains; how trains "communicate," etc. Students could get information from resource persons, library books, audio/visual aids, parents and other sources.
2. Use another resource person to initiate the study of railroad workers. Follow up the resource person's visit with a "talk-it-over" session in which youngsters are encouraged to verbalize their ideas, feelings and reactions.
3. Assist the youngsters in their efforts to find out more about trains and the railroad -- the different kinds of trains and their uses; the different types of railroad cars and how they are used; the various workers who help keep the trains running and the characteristics of their jobs; ways that trains assist the public, etc. Have the students show tangible evidence of their work by making such things as:
   a. Lists of vocabulary words and their working definitions.
   b. Mobiles of new and unusual vocabulary words.
   c. Lists of railroad workers and descriptions of their jobs.
   d. Chart of pictures of different kinds of railroad cars.
   e. Chart of important dates in the development of the train.
   f. Pictures of railroad workers in their work environment.
   g. List of ways that railroads help passengers and businesses.
   h. Lists of cargoes matched with the appropriate railroad car to transport them.
   i. Chart of various signals and signs used by railroad workers.
   j. List of names of famous railroads of then and now.
4. Encourage students to keep notebooks or folders of pictures, stories, newspaper clippings, reports, word lists and other items of interest to them in connection with the unit.
5. Utilize role playing techniques to help the youngsters understand and experience the need for individual responsibility in the group effort. Proceed the role playing activities with a discussion of the importance of each worker's contribution to the total operation of the train. Then, set up situations in which youngsters can see and feel the effects that one worker's or one group's failure to do the assigned job would have on the total effort.

6. Discuss with the students hobbies that are related to railroads. Talk about the hobby of collecting and building small, scale-model railroad cars and rail systems.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Give the students an opportunity to utilize their letter writing skills by encouraging them to write letters to various sources seeking information and materials. (See Bibliography for sources)
   b. Have students use the dictionary to help define new terms encountered in the unit. This activity gives them practice in using dictionary skills.
   c. Allow students to use their oral language abilities in such experiences as giving oral reports; asking questions on field trips; interviewing a resource person; giving directions for hands-on activities, explaining projects made, etc.
   d. Enrich students' vocabulary learning through the introduction of new words. Incorporate them into oral and written activities and reinforce learning by giving practice through spelling games, crossword puzzles, word drills, etc.
   e. Provide books of poems and stories for the students to enjoy. Also, read aloud to them from a favorite book related to trains and the railroad.
2. Mathematics
   a. Use large, multi-place figures taken from the railroad industry to give students practice in reading them correctly. Such figures as total miles of track, total numbers of passengers transported, freight tonnage and numbers of employees might be useful in this activity.
   b. Utilize skills of rounding by having students round the figures from the previous activity to the nearest thousand.
   c. Do work with fractions related to the railroad unit. Devise problems involving questions such as: One-third (1/3) of a train with ninety (90) cars equals how many cars? If one-half (½) a fifty (50) car train were added to one-third (1/3) of a sixty (60) car train, how many cars total would there be?
   d. For those students having difficulty conceptualizing fractions, devise activities in which they manipulate small railroad cars to equal fractional numbers.
   e. Try to obtain a railroad time-table and do some computation problems related to times of trips, average time on all trips, etc. Talk with the students about the importance of accurate time-keeping and do some computation problems related to times of trips, average time on all trips, etc. Talk with the students about the importance of accurate timekeeping to the railroads and their customers.

f. Incorporate linear measuring skills into hands-on activities to give students practice with the ruler and yardstick.

3. Social Studies
   a. Do some research into the history and development of trains. Obtain pictures of some of the early trains such as the Tom Thumb and show these to the students. A bulletin board on this topic might be a helpful instructional aid, also. Have the students compare and contrast the train as a form of transportation with the other forms common to that period.
   b. Lead a discussion of the ways that trains help the community by carrying passengers, hauling various kinds of freight and transporting the mail. Talk about the kinds of trains that do these things -- passenger and freight -- and describe their functions.
   c. Display a large map of the United States and use it to discuss with the students the different regions of the country and the various products and resources found in each. Talk with the children about the means by which these products are transported to other regions, mentioning trains as one important means of transportation.
   d. Introduce the children to some of the different kinds of railroad cars through an audio/visual aid such as a film, book or set of pictures. Discuss the various uses of these different types of cars such as flat cars, tankers, livestock carriers, boxcars, etc. As a game, have the children name as many different types of products as possible, matching each product to its appropriate railroad car.
   e. Continue the investigation of the different workers who are associated with the railroad. An audio/visual aid such as "Who Works at the Railroad Terminal" or "What You'd Expect to See at the Railroad Terminal?" might be helpful in this activity. Or invite another resource person to visit to describe the work role characteristics and conditions of various work roles.
   f. Talk with the students about the ways that trains communicate with other trains and with personnel at the station, discussing whistles as an important means of communication. Try to find tapes or records of the various whistles and help the children learn what meaning each one has.
   g. Introduce the motto of the railroad, "Safety First" and discuss it with the children. Identify some of the different precautions used by the railroad to insure the safety of its passengers, employees, freight and of the people crossing the tracks in cars and on foot. Those students who ride school buses could tell how the bus driver always stops at crossings.

4. Science
   a. Discuss with the students the ways energy is utilized to move an engine and train. Identify some of the forms of energy used to move locomotives -- coal, steam, electricity, diesel fuel -- and compare them as to economy, efficiency and cleanliness.

*b. Introduce the terminology of mechanical (potential and kinetic) heat and chemical energy. Define these terms in relation to trains and devise some simple experiments to illustrate them. To demonstrate how heat energy can be used, get a test tube, a support, a magnifying glass and a cork. Put a small amount of water in the bottom of the test tube, clamp it to a support that will hold it at a slant and cork the tube lightly. Be sure that the tube is turned away from you and other students. Focus sunlight through a large magnifying glass so that a bright spot is formed close to the tube's bottom. Soon the water will begin to boil and will produce steam to blow the cork out of the tube.

c. Use audio/visual aids to help reinforce student understanding.

5. Art
   a. Interest the students in making booklets of pictures of trains they have drawn or cut out from magazines.
   b. Make a mural of the different kinds of trains or scenes from a railroad terminal. Use chalks or tempera paint and butcher paper.
   c. Incorporate art skills and abilities into hands-on activities.
   d. Make colorful posters on railroad safety slogans.
6. Music
   a. Sing appropriate songs related to the railroad such as "I've been working on the Railroad."

D. SUGGESTED HANDS-ON ACTIVITIES

1. Collect different sizes of cardboard boxes (shoe boxes or grocery cartons) to use in building a model train and railroad track. Encourage students to work individually or in pairs to select a car to build, then cut and paint the box to represent that car. Put all the finished cars together to represent the train. Then use the model in role playing activities.
2. In connection with the previous activity, some students might like to use wood, cardboard, plastic and other materials to make railroad crossing signs, warning lights and other signal posts for use with the model railroad.
3. Involve the students in designing and constructing a scale model of a railroad terminal, switching station or community scene. Use cardboard papier mache, balsa wood, plastic or other materials to construct the layout. A real electric or windup train might be used in connection with the model and different children could be "engineer" for the day and run the train.

E. CULMINATING ACTIVITIES

1. Plan and take a class field trip to a railroad terminal such as Inman Yards in Atlanta. Or, visit an amusement park such as Stone Mountain or Six Flags and ride the train there. After the trip, have a talk-it-over time

* PROBING INTO SCIENCE, American Book Company

in which youngsters are encouraged to verbalize their reactions to the trip and to the people they encountered.

2. Dramatize a train trip in the classroom with different students assuming different work roles in the operation of a train. Allow students to exchange roles so long as to experience a wide range of feelings.
3. Invite parents, other classes and friends to visit the class to see art and hands-on projects, hear reports of activities and research assignments and to view role playing activities.
4. Show any remaining interesting films or filmstrips and discuss them with the students.
5. Make the final edition of the class unit scrapbook and share it with other classes.
6. Give post-test or concluding questionnaire. Compare results with those from the initial test and discuss them with the students.

F. FOLLOW-UP ACTIVITIES

1. Continue to use words from unit activities in spelling games, crossword puzzles and other oral and written learning experiences.
2. Plan a summarizing oral evaluation session and involve students in verbalizing their reactions to unit activities. Encourage them to talk about their roles, ways projects and activities could be improved, "high and low" points, etc.
3. Use unit terms in making questions for the "Knowledge Game." Include such questions as: What name is given to the method of transporting loaded tractor-trailer trucks on railroad flat cars? Piggy-backing. Which railroad worker takes up the passengers' tickets on board the train? The conductor. What are the two (2) main types of trains? Passenger and freight.
4. Capitalize on the students' interest in and knowledge of the railroad as one means of transportation by investigating another area in the cluster.

VI. POSSIBLE MATERIAL AND EQUIPMENT NEEDS

A. Cardboard Boxes
B. Refrigerator Carton
C. Construction Paper
D. Poster Paper
E. Scissors
F. Rulers and Yardsticks
G. Tempera Paint
H. Paint Brushes
I. Cardboard Sheets
J. Papier Mache
K. Plastic
L. Aluminum Foil
M. Plywood
N. Exacto Knives
O. Bulletin Board Materials
P. Textbooks
Q. Library Books
R. Magazines
S. Newspapers
T. Pamphlets
U. Audio/Visual Materials
V. Audio/Visual Equipment
W. Magic Markers
X. Butcher Paper

Y. Scrapbook
AA. Dictionary
BB. Railroad Timetable
CC. Test Tube and Cork
DD. Support
EE. Magnifying Glass
FF. Camera and Film
GG. Masking Tape

VII. EVALUATION

A. SELF-EVALUATION

1. Did I attain all the goals I had set for myself as a teacher?
2. Did I incorporate all six (6) elements of the Career Development approach into the unit study?
3. Did I involve all youngsters to the maximum extent possible in the planning and coordinating of unit activities?
4. Did I plan effectively, utilizing methods and materials wisely?
5. Did I generate the maximum level of interest and participation through effective and reinforcing motivational activities?
6. Did I encourage students to verbalize their feelings and reactions following role playing activities?
7. Did I maintain a classroom atmosphere conducive to learning?
8. Did I use the most effective means of correlating the subject matter?
9. Did I facilitate expressions of both individual initiative and group interest.
10. Did I plan activities so as to individualize instruction as much as possible?

B. OBSERVATIONS OF THE CHILD

1. Observe the flexibility of individual role interaction within the group.
2. Observe for evidence of individual research and task completion.
3. Observe for evidences of strengthening of individual self-images.
4. Observe the youngster's ability to apply his abstract knowledges to concrete learning situations.
5. Observe the student's use of communication skills both as an individual and as a member of the group.
6. Look for evidence of social interaction skills -- does the child accept responsibility willingly, complete tasks, share materials, take turns and communicate well with his peers?
7. Observe for any evidence of change in attitude toward school-related activities and the work community.

C. WRITTEN EVALUATION

1. Match the word in the left column with its correct meaning in the right. Write the letter of the correct meaning in the blank beside the word.

_____	Railroad	a. Means of transportation
		b. Communication
_____	Train	c. String of connected railroad cars
		d. Steel track and train system.
_____	Transportation	

2. Name as many work roles as you can that are related to trains and the railroad.
3. What are some of the ways that trains help us?
4. Fill in the blanks with the appropriate word.
   A_____ is an enclosed freight car used to haul packaged goods or grain. Fresh fruits, cold foods and meats are hauled in the_____car. Liquids such as gasoline or oil are transported in_____ cars. The last car on every freight train is red and is called the_____.

VIII. AUDIO/VISUAL AND RESOURCE MATERIALS

A. AUDIO/VISUAL

1. Films
   a. "Energy"
   b. "Energy and Work"
   c. "Freight Stop"
   d. "Freight Train"
   e. "How Power Drives Machines"
   f. "Lonesome Whistle"

GEORGIA CATALOG OF CLASSROOM TEACHING FILMS, 1972-75.

   g. "Trains: A First Film"

BFA EDUCATIONAL MEDIA -- SANTA MONICA, CALIFORNIA

   h. "Transportation: Footpath to Air Lane"
   i. "Trucks and Trains"

CHURCHILL FILMS -- LOS ANGELES, CALIFORNIA.

2. Filmstrips
   a. "What You'd Expect to See at the Railroad Terminal"
   b. "Who Works at the Railroad Terminal?"

BFA EDUCATIONAL MEDIA -- SANTA MONICA, CALIFORNIA.

   c. "The Story of Transportation" (Series)

EYE GATE HOUSE -- JAMAICA, NEW YORK

   d. "Transportation: Our Railroads" (Series)

IMPERIAL CHARLES CLARK AUDIO VISUAL -- FARMINGDALE, NEW YORK

3. Cassettes
   a. "Trains"

TROLL CHARLES CLARK AUDIO VISUAL -- FARMINGDALE, NEW YORK

B. RESOURCE MATERIALS

1. Teacher Bibliography

a. Alexander, Edwin; AMERICAN LOCOMOTIVE. W. W. Norton and Company, Inc., 1950.

b. Dunbar, Seymour; A HISTORY OF TRAVEL IN AMERICA. Bobbs-Merrill Company, 1937.

c. Henry, Robert Selph; TRAINS. Bobbs-Merrill Company, 1954.

d. Jesserand, Peter; RIGHTS OF TRAINS. Simmons-Boardman Publishing Corporation, 1954.

e. Meeks, Carrell; THE RAILROAD STATION. Yale University Press, 1956.

f. Mencken, August; THE RAILROAD PASSENGER CAR. Johns Hopkins Press, 1957.

g. Roberts, MacLennan; THE GREAT LOCOMOTIVE CHASE. Dill Publishing Company, Inc. 1956.

h. Van Metre, Thurman William; TRAINS, TRACKS AND TRAVEL. Simmons-Boardman Publishing Corporation, 1960.

i. Webb, Robert; THE ILLUSTRATED TRUE BOOK OF AMERICAN RAILROADS. Grossett and Dunlap, Inc., 1957.

2. Additional Resources

a. "A Brief History of the Union Pacific Railroad"
Union Pacific Railroad, 1416 Dodge Street, Omaha, Nebraska 61802.

b. Association of American Railroads
Public Relations Department, American Railroad Building, 1920 L. Street, N.W. Washington, D.C. 20036

c. Costello and Wolfson; CONCISE HANDBOOK OF OCCUPATIONS. Chicago: Ferguson, 1971.

d. DICTIONARY OF OCCUPATIONAL TITLES
U.S. Government Printing Office, Washington, D.C. 20402.

e. "Milepost 100"
Atchison, Topeka and Santa Fe Railroad System, Public Relations, Railroad Exchange, 80 East Jackson Boulevard, Chicago, Illinois, 60604.

f. OCCUPATIONAL OUTLOOK HANDBOOK
U.S. Government Printing Office, Washington, D.C. 20402.

g. SRA OCCUPATIONAL BRIEFS
259 East Erie Street, Chicago, Illinois 60611.

h. "Transportation Crisis"
Catepillar Tractor Company, 100 N.E. Adams Street, Peoria, Illinois 61602

IX. CHILDREN'S BIBLIOGRAPHY

A. Brown, Margaret Wise; TWO LITTLE ENGINES. William R. Scott, 1957.

B. Bunce, William; HERE COMES THE SCHOOL TRAIN. Dutton and Co., 1953.

C. Burleigh, David Robert; PIGGYBACK. Chicago: Follett Publishing, 1962.
D. Lewellen, John; YOU AND TRANSPORTATION. Chicago: Children's Press.
E. Petersham, Maud and Miska; THE STORY BOOK OF TRAINS. Chicago; John C. Winston Company, 1947.
F. Piper, Watty; THE LITTLE ENGINE THAT COULD. Platt and Munk, 1954.
G. Potter, Marion, THE LITTLE RED CABOOSE. Simon and Schuster, 1953.
H. Provus, Malcolm; HOW WE TRAVEL ON LAND. Chicago: Benefic Press, 1962.
I. Scarry, Richard; WHAT DO PEOPLE DO ALL DAY? New York: Random House, 1968.
J. Shelby-Loundes, Joan; CIRCUS TRAIN. Abelard-Schuman, 1957.
K. Wadsworth, Wallace; CHOO-CHOO THE LITTLE SWITCH ENGINE. Rand-McNally, 1954.
L. Weisgard, Leonard; THE BIG BOOK OF TRAIN STORIES. Grossett--Dunlap, 1955.
M. Yates, Raymond: THE BOY'S BOOK OF MODEL RAILROADING. New York: Harper and Brothers, 1951.

MUSIC

Careers in Fine Arts & Humanities

Grades 3 & 4

Teachers Resource Guide

INTRODUCTION TO MUSIC

Planning and implementing a unit on musical careers is an excellent teaching method to capitalize on the interests and abilities of children in the middle elementary age group. Their expanding interests and developing abilities allow youngsters to participate fully in the unit activities. Subject matter concepts in science and music are easily correlated, and the unit activities provide a variety of learning experience for all children. Participating in the music unit activities gives students an additional means of self-expression, encourages self-identification of interests and abilities and stimulates awareness of the work community.

I. GOALS, OBJECTIVES AND CONCEPTS

A. TEACHER GOALS

1. To stimulate the student's awareness and appreciation of music as both a vocation and avocation.
2. To expand the student's attitudes about the work community and his relation to it.
3. To encourage the student to exercise his creative abilities and to discover a variety of ways to reach solutions through active inquiry.
4. To provide the student additional opportunities to participate in the decision-making process.
5. To broaden the base of the student's experiences by incorporating content skills into activity-centered learning situations.
6. To create opportunities for both individual activities and participation in the group process.
7. To assist the student in identifying his interests and self-characteristics in relation to the field of music.
8. To stimulate social interaction skills as the individual functions within the group.
9. To stimulate the student's realization that all areas of work are dignified, deserve respect and contribute to a wholesome society.
10. To provide additional outlets for student self-expression through musical activities.

B. LEARNER (BEHAVIORAL) OBJECTIVES

1. By the end of the unit study, the learner will be able to spell and define briefly 75% of the related vocabulary terms. Also, he will be able to use them correctly in the context of classroom activities and written assignments.
2. The learner will be able to list a minimum of eight (8) workers whose jobs are directly related to the music field.
3. The learner will be able to describe the appropriate duties of these eight (8) workers with 75% accuracy in the descriptions.
4. Given a list of musical personnel and their job duties, the learner should be able to match the workers with their respective duties with 75% accuracy.
5. In a brief written or oral statement, or in a simple graphic illustration, the learner will be able to describe the way in which sound is produced, transmitted and transformed back into sound by a receiver.
6. The learner should be able to name the three (3) characteristics of sound -- loudness, pitch and tone quality.
7. The learner will be able to identify a minimum of ten (10) musical instruments
8. By the end of the unit, the learner will be able to name the five (5) basic

categories of musical instruments and name two (2) examples under each category.

C. CONCEPTS*

1. Music is an art, the art of expressing ideas and feelings through musical sounds.
2. At the same time, music is a science, the science of sound. Different branches of science make important contributions to music.
3. Sound always starts out as movements, very fast back and forth movements called vibrations.
4. Vibrations may be felt by placing your hand on a radio or phonograph that is playing.
5. When something is vibrating, the air around is set into vibrations. The vibrations spread out from the vibrating body in all directions as sound waves.
6. Every sound has three (3) characteristics -- loudness, pitch and tone quality.
7. The human ear is equipped to pick up sound waves, transform them into vibrations and channel those vibrations to the auditory nerve where they are converted into nerve impulses. These nerve impulses are transmitted to the brain where the sounds are given meaning.
8. The science of acoustics deals with anything related to hearing.
9. To make music, men developed instruments using primitive materials such as skins, wood, hide, stones, reeds and leather.
10. Through the years, men have developed new instruments and refined others to a high degree.
11. In the field of modern musical instruments, the "families" in the field are percussion, the brasses, the woodwinds, the keyboard instruments and the strings. All musical instruments can be classified under these headings.
12. Stringed instruments produce sound when a bow or pick is drawn across one or more of the strings.
13. The piano, a keyboard instrument, combines characteristics of both the strings and percussion instruments.
14. Woodwind instruments produce sound by passing wind through a hollow piece of wood.
15. Air passing through the mouthpiece in brass instruments vibrates and causes the air in the tubing to vibrate, thus creating the sound.
16. Percussion instruments produce sound when they are struck by a hand or another object and vibrations are created.
17. In the field of music, people can find many jobs requiring different levels of preparation and education.
18. Successful professional musicians must undergo a long period of intensive training in instruments, music theory and application.
19. An "ear" for music, a deep interest in the subject and the patience and

* Science and Music, Berger and Clark

determination to practice long hours are necessary requirements for the musician.

20. In addition to the active performing musician, many workers are found in the musical field. Conductors, arrangers, composers, recording engineers, lyricists, and technicians -- all are necessary and extremely important members of the field of musical careers.

II. SUBJECT MATTER

A. DEFINITION OF TERMS

1. Music: a. The art of organizing tones to produce a coherent sequence of sounds intended to elicit an aesthetic response in a listener; b. Vocal or instrumental sounds having some degree of rhythm, melody and harmony, c. A musical composition.
2. Sound: A vibratory disturbance . . . capable of being detected by the organs of hearing; b. The sensation stimulated in the organs of hearing by such a disturbance.
3. Tone: a. A sound of distinct pitch, quality and duration; b. Quality of sound

B. SUGGESTED VOCABULARY TERMS

1. Acoustics
2. Beat
3. Ear
4. Instrument
5. Loudness
6. Music
7. Pitch
8. Rhythm
9. Sound
10. Tone
11. Tune
12. Vibration

C. CLASSIFICATION OF MUSICAL INSTRUMENTS

1. Brass
   a. Trumpet
   b. Cornet
   c. French Horn
   d. Trombone
   e. Tuba
   f. Mellophone
2. Percussion
   a. Timpani
   b. Xylophone
   c. Glockenspiel
   d. Chimes
   e. Marimba

f. Snare Drum
g. Bass Drum
h. Triangle
i. Cymbals
j. Castanets

3. Keyboard
   a. Celeste
   b. Piano
   c. Organ
   d. Harpsichord
4. Woodwinds
   a. Flute
   b. Piccolo
   c. Bassoon
   d. Saxophone
   e. Clarinet
   f. Oboe
   g. English Horn
5. Strings
   a. Violin
   b. Viola
   c. Cello
   d. Double Bass
   e. Bass
   f. Harp
   g. Guitar
   h. Electric Guitar

III. OCCUPATIONAL INFORMATION

A. GENERAL DESCRIPTION

A wide selection of jobs related to music are available to persons with interest and talent. Musicians, singers, music teachers, composers, band leaders, recording artists, arrangers, promoters, managers and representatives -- all have jobs closely related to music. Different levels of jobs exist, depending upon the talent, skills, interests and amount of music knowledge of the individual.

B. JOB ENTRY AND PREPARATION

To gain entry into an occupation related to music, a person should assess his own interests and abilities, choose a career appropriate for him and investigate the job requirements for education and experience. Certain positions in the field of music require specialized college or music school preparation; others involve a basic education and musical training and ability.

C. GENERAL REQUIREMENTS

Of all requirements, talent and interest are probably the most important since they serve as a foundation for most all success. The ability to concentrate; the willingness to devote long hours to intensive practice; an "ear" for sound and music; and a great deal of patience and determination are necessary attributes of a person selecting a musical career, especially one as a performing musician.

D. WORKING CONDITIONS AND BENEFITS

Musicians might work in an orchestra or a dance band or combo playing in a small night club or listening room. Usually they specialize in either popular or classical music with only a few performers playing both types professionally. Some of the better players or the more famous ones may play solo concerts or appear on television.

Classical musicians usually play in opera and theater orchestras, symphony orchestras and for other kinds of performances requiring orchestral accompaniment. Some work as accompanists for instrumental or vocal soloists while others work in churches and often direct the choir.

A large percentage of musicians do not play professionally but work as teachers in music conservatories and universities. Some work as private teachers, giving lessons to individuals or groups. Others find employment in public school systems working with groups of students. Some few musicians work in the field of musical therapy in hospitals.

Other people may find work independently as composers, lyricists and arrangers of materials for singers and entertainers. Some may work as salesman or representatives for music companies or instrument manufacturers -- positions involving knowledge of fundamental concepts of music. Additional auxiliary personnel whose jobs are related to music include managers of bands or music groups and promoters of concerts.

Employment in this field may be irregular and workers may have to supplement their earnings by working a number of jobs. The field of performing musicians is a crowded one which makes competition for positions with some stability of employment quite keen.

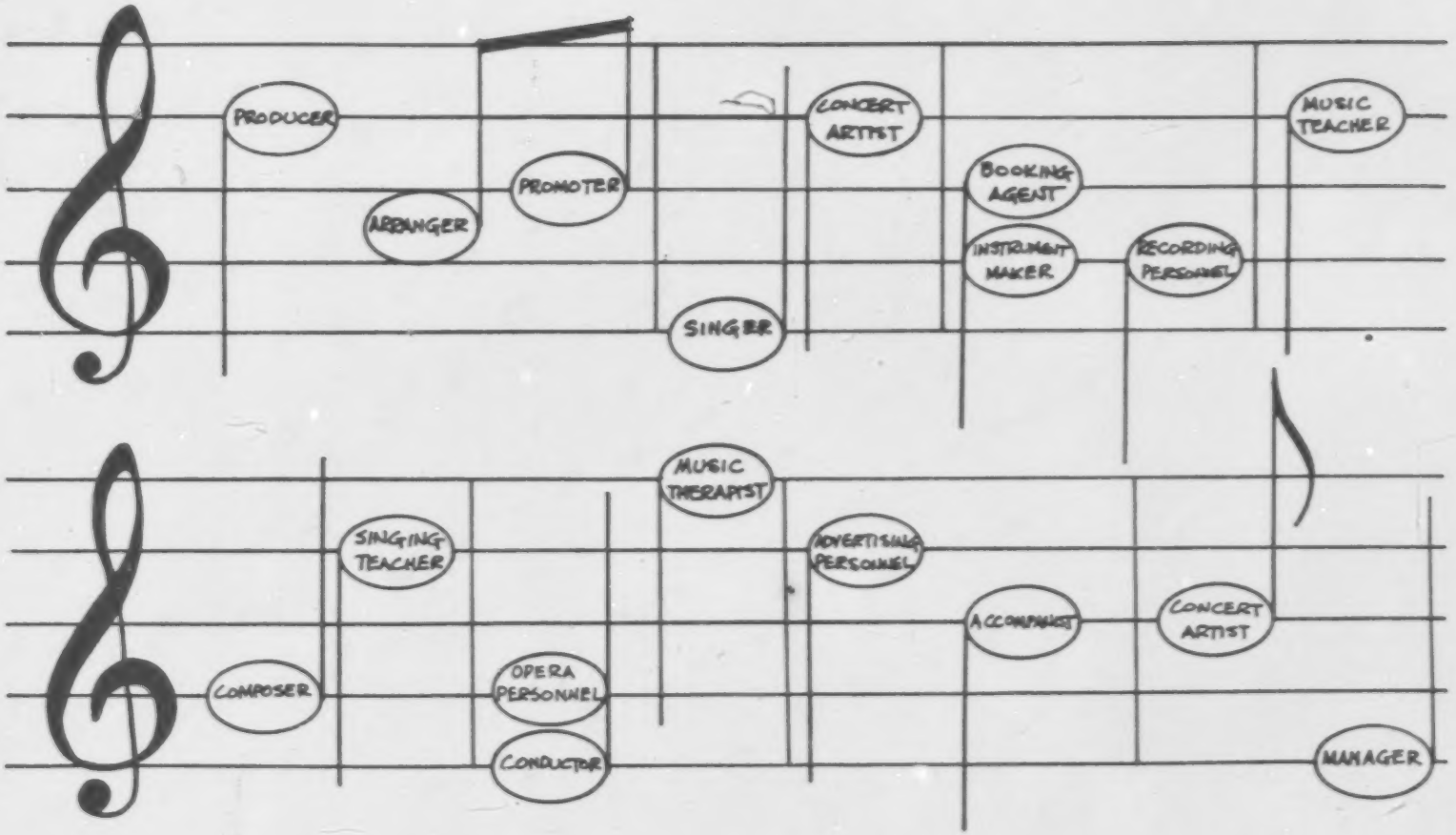
E. OCCUPATIONAL LISTINGS (See Next Page)

IV. MOTIVATION ACTIVITIES

A. Select recorded music with a strong beat and simple instrumentation. Use the selections in dancing and other physical activity sessions with the students. Encourage the youngsters to mark the beat of the music by clapping or keeping time with a pencil or some similar object.

B. Talk about the musical selections and the instruments that are used to make

Careers in Music



the music. Try to identify some of the instruments used in the recording.

C. Obtain and display some simple musical or rhythm band instruments. Talk about the sounds made by those instruments and how they are used in making music.

D. Make a bulletin board of pictures, charts or posters depicting musical instruments, the historical development of different instruments and other related topics.

E. Select and show any appropriate films. "Toot, Whistle, Plunk and Boom," or "Music To Tell a Story," are some examples of related films.

F. Introduce the idea of music-making both as a hobby and as a career. Discuss this idea with the class and question them as to family members, relatives or friends who make music either as a hobby or as a career.

G. After identifying some instruments and introducing the idea that making music can be both a source of pleasure and an occupation, talk about some of the jobs that might be related to music. One area of the music field is concerned with making instruments for musicians. The class might be interested in making some simple musical instruments to use in the unit and in related music activities.

V. STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. During a class discussion, the class could divide into committees or interest groups to decide the instruments to be made, the best ways to make them, materials to be used, sources of materials, etc. Groups could report to the class as a whole to decide on the instruments to make.
2. At this point, another film, filmstrip or teacher-made tape could be used to increase student interest and knowledge.
3. Begin collecting materials, pictures, information, etc., into a central file or scrapbook. Encourage students to bring in materials from home and other sources.
4. Discuss resource persons to be invited into the classroom -- identify persons such as parents, friends, community representatives who might be helpful.
5. Teaching tapes could be made or obtained to provide information on a number of topics -- famous names in music; current events in the musical world; the story of the instruments and other topics of interest. Individuals could listen to these and write brief reports or summaries for the class scrapbook.

6. After identifying musical instruments to be made, students could determine needed materials and begin bringing these in to the class.

7. Student groups could make wall charts or posters of occupational listings and unit information, decorating them with pictures or original art work. New titles could be added as the unit progresses.

B. RESEARCH ACTIVITIES

1. Talk about the historical development of the instruments in the modern orchestra. Try to find pictures depicting some of the early instruments and how they were made. Talk about the "families" of instruments and how these early instruments fitted into the categories of brass, percussion, strings, woodwinds and keyboard according to their characteristics.

2. Make organizational charts of musical careers which might be helpful in identifying the many careers found in the field.

3. Invite resource person into the classroom to share experiences and information with the students. Before the visit have a preparation session to get the students ready.

4. Plan a field trip into the community. Talk about some of the areas that might be visited and some of the things that could be seen there.

5. Make index cards or "description sheets" on different musical careers. Record information such as characteristics of the job, duties, qualifications and other pertinent facts. Illustrate with pictures or original artwork.

6. Talk about different areas of the world that have instruments and music Different from America. Introduce the culture and music of South America, India or other countries of interest. Research could be done to discover which instruments have been directly imported into our culture from other countries.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Individual reading assignments could be made on books about music in other countries, making musical instruments, famous names in music, stories behind famous operas, etc. Students could make oral reports on their reading assignments using a tape recorder to record their voices.
   b. Vocabulary lists could be made of the new words. A central notebook

of words, wall charts of words and individual notebooks could be made to keep lists of these words. During an activity period, children could use magazines or newspapers to cut out pictures to illustrate these vocabulary listings.

c. Practice punctuation skills by having students write letters of information or thank-you to appropriate sources. Either students could compose their own letters or the teacher could supply a model.

d. Select poems about music or musical instruments and read them in class. Students might wish to have individual copies to illustrate and keep in their notebooks.

e. Make a display of books to stimulate interest in reading about music.

f. Talk about the language arts skills used by people in the music field. (reading, writing, oral language and listening are some of the ones emphasized most strongly in this area.) Role play some situation illustrating the direct use of language arts skills -- musicians listening to directions given by a director or conductor, singers reading the lyrics of a song before singing it in a recording session, etc.

2. Mathematics

a. Talk about the concept of sets in connection with musical instruments and musical careers. Examples that might be used as illustrations could be the set of all musical instruments, the subsets of the "families" of instruments; or, the set of all musicians, the subset of those who play just for a hobby or for pleasure, those who play as a career, etc. Students could use pictures in working with these examples.

b. Make addition and subtraction problems dealing with prices of materials, numbers of instruments available, numbers of people in an orchestra, etc.

c. Identify some of the geometric shapes seen in musical instruments. Simple ones are lines, triangles, circles, balls, rectangles, etc.

d. Make division problems from division sentences referring to musical instruments -- an example might be: Some children wanted to play in a band. There were eight (8) children and only four (4) different instruments. How many could play at a time?

e. Incorporate problems related to fractional measures into unit activities by tying it to measuring materials in making the instruments.

3. SCIENCE

a. Talk about the human senses and which ones are involved in making music -- sight, hearing, touching. Name ways that these senses are involved in the process of making music.

b. Define the terminology of sound and talk about the way sound is produced. Introduce the idea of vibrations and sound waves and have charts that illustrate the concept. Set up simple experiments to

experiments to illustrate the way sounds are made.

*c. Do simple experiments such as hitting a yardstick over the edge of the table to see the vibrations. Also, do simple experiments to demonstrate the three (3) characteristics of sound -- loudness, pitch and tone quality. For loudness, take a wooden or plastic yardstick, holding it on the nine inch (9") mark and strike the end of the table. Hit the yardstick lightly and listen to the loudness as it vibrates, then hit the stick harder and harder and compare the loudness of the notes with the first ones. To experiment with pitch, hold the yardstick at the nine inch (9") mark and hit the end to make it vibrate. Now slide the grip up to the eighteen inch (18") mark and strike it again. Experimenting with tone quality involves the construction of a monochord. (See Supplementary Information)

d. Make diagrams of the human vocal chords and vocal system to explain the human voice. Do simple experiments such as holding the hands over the throat and singing a low note, then switching to a higher note to feel how the voice box seems to jump as the muscles tighten. Talk about the different kinds of voices and how they are caused. (alto, soprano, bass, tenor, etc.)

e. Talk about the materials used in making musical instruments -- the characteristics of them that make them useful for making music. Look at the materials being used in making the class instruments and have the same discussion. Talk about the hardness of wood and of metal, the elasticity of string and catgut or nylon, the softness and tautness of hides or leather, etc.

4. Social Studies

a. Make a brief study of the history of music and musical instruments. Identify possible ways in which first musical instruments could have been developed and talk about the reasons for the development of music.

b. Use a large world map or globe to talk about different countries and the music that is native to their cultures. Pinpoint such areas as South America, Mexico, India, the Oriental countries, Hawaii and the Polynesian Islands. Try to play some recorded selections of these different types of music and talk about the instruments that are used to make the music.

c. Bring the discussion of music and instruments to a national, regional and community level. Talk about the different kinds of music and instruments in America that were once found only in particular regions -- country music with banjo, harmonica and guitar in the South and Midwest; folk-singing with guitars in the West and other types of music. Play some selections of these different types of music and use wall maps to pinpoint these areas.

d. Talk about the way many benefit from music -- as a source of pleasure or relaxation, as a hobby or past-time, as a career or occupation in some area of the music field. Identify some of the different styles of music and the career areas that are associated with these different

* Berger and Clark, Science and Music

styles--classical, modern, rock, folk, soundtracks and films and movies.

e. Discuss the necessity of working together as a whole and stress the importance of each person's contribution toward the cooperative effort. Use the orchestra and its workings to exemplify this idea.

5. Art

   a. Make a mural depicting various people at work in the field of music. Use butcher paper, poster paints or tempera.
   b. Paint and decorate the musical instruments made in the class activities. Use paints, trims, glitter, braid and other items to decorate.
   c. Draw individual pictures of musical instruments to make a bulletin board of an orchestra arrangement.

6. Music

   a. Play different selections of music. (from different selections of the USA and from different countries.)
   b. Use instruments made in activities to play musical selections or to keep time and rhythm with recorded music.
   c. Study charts of musical "families" and discuss instruments found under each heading.

D. CULMINATING ACTIVITIES

1. Take planned field trip to selected site (music store, symphony, band room at junior or senior high school, recording studio, etc.) preceding and following the visit with discussion period of ideas, things to observe and other important items.
2. Invite additional resource persons into the class.
3. Reshow any pertinent films or filmstrips in light of present knowledge.
4. Have oral reports from individuals or groups. Tape these reports for future reference.
5. Complete work on hands-on activity of making the musical instruments. Either display them for visitors or plan a rhythm activity using the instruments with recorded music or just by themselves. Involvement in rhythm activities allows the children to simulate the activities of musicians.

E. FOLLOW-UP ACTIVITIES

1. Have written or oral evaluation of unit by students citing likes, dislikes, feelings about music.
2. Continue to use musical instruments during music and rhythm activities. From time to time, play games with the children concerning names of instruments and names in music to reinforce previous learnings.

F. SUGGESTED HANDS-ON ACTIVITIES

1. Choose instruments to make and encourage students to organize into groups. Bring in materials and make rhythm instruments. (See supplementary Information).
2. Simulate (rôle play) the activities of the recording studio using the classroom tape recorder. Tape groups singing or playing instruments and then review the tapes. Talk about how the activity approximates duties of workers in these work roles.
3. Youngsters could organize themselves into a music store or company. Props such as shelves or counters could be made to display the instruments and children could assume the roles of salesman, manager, demonstrator, customers, etc.

VI. MATERIALS SUPPLIES AND EQUIPMENT

A. Tin Cans
B. Poster Paper
C. Milk Cartons
D. Marking Pens
E. Tin Pie Pan
F. Records
G. Soda Bottle Caps
H. Record Player
I. Wire
J. United States Map
K. Wrapping Paper
L. Globe
M. Inner Tube
N. Tacks
O. String
P. Dried Beans
Q. Heavy Rubber Bands
R. Pebbles or Small Rocks
S. Cheesecloth
T. Scissors
U. Walnuts
V. Hand Drill
W. Tempera Paint
X. Nylon Fishing Line
Y. Poster Paint
Z. Nails
AA. Varnish
BB. Yardsticks
CC. Paint Brushes
DD. Wood
EE. Drawing Paper
FF. Saw
GG. Construction Paper
HH. Hammer
II. Tape Recorder
JJ. Cigar Box
KK. Shoe Box
LL. Glitter
MM. Braid
NN. Trim
OO. Glue
PP. Dowel Sticks
QQ. Wooden Beads
RR. Bottles
SS. Garden Hose
TT. Bottle Nipple
UU. Magazines

VII. EVALUATION

A. SELF-EVALUATION

1. Did I play effectively, utilizing methods and materials wisely?

2. Did I cover all six (6) elements of the Career Development approach sometime during the course of the unit study?
3. Did I generate the maximum level of interest and participation through effective motiviaton activities?
4. Did I maintain a classroom atmosphere conducive to learning?
5. Did I involve the students in the planning to the maximum degree possible?
6. Did I plan activities effectively to include each child to the best of his ability?
7. Did I program activities so as to individualize instruction?
8. Did I use the most effective means of correlating the subject matter?

B. OBSERVATIONS OF THE CHILD

1. Observe the flexibility of individual role interaction within the group.
2. Observe the child's use of communication skills both as an individual and as a part of the group.
3. Observe for evidence of individual research and task completion.
4. Look for evidence of social interaction skills -- does the child share materials, take turns, accept responsibility willingly and communicate well with his peers?
5. Observe for any evidences of change in attitude toward school-related activities. Look for any changes in attitude toward the world of work.
6. Observe for evidences of strengthening of individual self-images.

C. WRITTEN EVALUATION (Pre and Post Test if Desired)

1. Students will:
   a. Name as many workers as possible whose work in related to music.
   b. Spell and define a group of words read aloud by teacher.
   c. Name as many different musical instruments as possible.
   d. Identify the major divisions of the orchestra.

VIII. NOTES TO THE TEACHER

This unit format has been developed as the most convenient method of organizing the materials and activities in order, beginning with objectives and concepts, including motivation and study activities and concluding with evaluation and source material lists. A wide range of materials, facts, ideas, and activities is presented to allow each individual the opportunity to structure his unit to fit the needs of a particular class. Selecting and combining activities, adjusting the scope of the unit, supplementing materials to meet the needs of his class -- all these are teacher strategies that may be used with this unit format. The six elements of the Career Development approach are included in this guide, but it is the individual teacher's ordering of them that makes his class unit unique.

IX. RESOURCE MATERIALS

A. TEACHER AIDS

1. Films
   a. "Music To Tell A Story"
   b. "Toot, Whistle, Plunk and Boom"
   CATALOG OF CLASSROOM TEACHING FILMS FOR GEORGIA SCHOOLS, 1968 - 71.

B. LEARNING MATERIALS

1. "The Ear" (Model and sound learning kit) Education 70's; Office Sales and Service Catalog.
2. "Rhythm Band Records", LeCrone, Office Sales and Service Catalog.

X. BIBLIOGRAPHY

A. CHILDREN'S SELECTIONS

1. Berger, Melvin and Frank Clark, Science and Music, New York: McGraw Hill, 1961.
2. Burt and Ferguson, So You Want To Be In Music? Abingdon Press.
3. Collier, J. L., So You Want To Be A Rock Star, Four Winds Scholastic Book Services.
4. Leeming, Josephy, The Real Book About Easy-Music-Making, Garden City: Garden City Books, 1952.
5. Levine, Jack and Takeru Iijima, Understanding Musical Instruments, New York: Frederick Warne and Company, 1971.
6. Wilson, Robina, Musical Instruments, New York: Henry Walck, Inc. 1966.

B. TEACHER SELECTIONS

1. Ladbeck, Croak and Youngberg, Making Music Your Own, Morristown, New Jersey: Silver Burdett, 1965.

C. SUPPLEMENTARY MATERIAL SOURCES

1. American Federation of Musicians, 641 Lexington Avenue, New York, New York 10022.
2. National Association of Schools of Music, 1424 16th Street, N.W., Washington, D.C., 20036.

D. ADDITIONAL SOURCES OF MATERIALS

1. Musicians (various titles) NVGA Current Career Information Catalog,

American Personnel and Guidance Association, 1607 New Hampshire Avenue, N. W., Washington, D.C. 20009.

ADDITIONAL SOURCES

D.O.T.

Occupational Outlook Handbook

SRA Occupational Briefs

*SUPPLEMENTARY INFORMATION

Making Musical Instruments

TAMBOURINE: Use an old pie pan and punch six (6) holes along the edge. Take twelve (12) soda bottle caps, remove corks, hammer the caps flat and put a nail hole through the center. Next, take six (6) three-inch (3") lengths of wire and attach two (2) caps to each hole.

DRUM: Drums can be made from a tin can and heavy wrapping paper. Take four (4) sheets of wrapping paper and glue two (2) together for one head and two (2) for the other. Be sure to have enough paper to have two inches (2") hanging over the edge of the shell. Stretch the heads very tightly over the top and bottom of the shell and secure them with a string or a heavy rubber band around the edges. If you want to make stronger heads, put a layer of cheesecloth between the pieces and shellac them together. You can make a drum with only one head by stretching a drum-head over a mixing bowl, water pail or coconut shell.

TRIANGLE: Hold a horseshoe on a string and strike it with a long nail.

CASTANETS: Use a walnut and be careful to open it and remove the meat so as to get two (2) unbroken, uncracked halves. Drill two (2) holes about one-half inch (½") from the edge of each half of the shell. Loosely tie the two (2) halves with string and paint or varnish the shell. Hook the middle finger through the loops on the outside of the shells.

MARACAS: Get two (2) empty milk cartons, scrape the wax and shellac with a thin coat. Put a handful of dried limas into them and glue the the lid shut. Make a small hole in each end with a pair of scissors

and push a dowel stick (or pencil) through the openings. To secure the homemade maraca to the dowel stick or pencil, wrap a piece of thin wire around the stick several times on the top and bottom of the maracas. Attach the wire to the dowel by a small tack and push the end of the wire into the maraca.

MONOCHORD: Materials required for this instrument includes some nylon fishing line, two (2) nails, a yardstick and a strip of wood about forty (40) inches long and one-half (½) inch thick. Put the yardstick on the board and next to the ends of the yardstick, drive the nails part way in. The nails should be exactly thirty-six (36) inches apart. Bend the tops of the nails toward each other and tie the nylon line near the heads of the nails. Then slide the knots to the bottom of the nail and straighten them out. Now slide the knots up so the line is tight and about one-half (½) inch above the board.

Saw two (2) inches off the yardstick cutting at the thirty-four (34) inch mark. Now put the yardstick under the string, with zero against one of the nails. Stand the two (2) inch piece of yardstick that you cut off on edge at the nine (9) inch mark, dividing the string into one quarter and three quarters.

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THE NEWSPAPER

Careers in Communications and Media

Grades 5 & 6

Teachers Resource Guide

INTRODUCTION TO THE NEWSPAPER

Presenting a newspaper unit on the fifth and sixth grade level provides many opportunities for interesting and enriching activities. All subject matter areas, especially language arts and social studies, may be related easily to the journalism field. Investigating the occupational offerings in the journalism field and the closely allied publishing and graphic arts industries is an excellent means of giving students valuable knowledge and experience and stimulating student respect for various work roles. The concrete activity of organizing, writing, editing and publishing a newspaper involves students' using their abstract knowledge and skills in a practical application.

I. OBJECTIVES AND CONCEPTS

A. OBJECTIVES

1. General Objectives
   a. To stimulate appreciation of various workers and their role in society.
   b. To provide experience in observation, cognitive processes and verbalization of ideas.
   c. To stimulate social interaction skills as the individual functions within the group.
   d. To provide opportunities for both individual research activities and group processing.
   e. To encourage the child to identify his self-characteristics and how they relate to this area of mass communication.
   f. To develop verbal and written communication skills.
   g. To increase vocabulary and to enhance research and investigation skills.
   h. To encourage and provide a measure of personal success through individualized instruction.
   i. To increase student knowledge of his role in relation to the community.
   j. To give the student additional opportunities for developing his self-expression by using his creative potential.
   k. To broaden the base of student experiences by incorporating content skills into activity-centered learning situations.
   l. To provide additional opportunities for student involvement in decision-making processes.
2. Behavioral Objectives
   a. At the end of the unit, the student will be able to name at least ten (10) workers in the newspaper field and describe their duties.
   b. Given a group of occupational titles in the newspaper field, the students will be able to organize them under the three (3) department headings of editorial, mechanical and business according to the characteristics of each work role.
   c. Students will be able to spell and define at least 75% of the vocabulary words from the unit study.
   d. At the conclusion of the unit, the students will be able to solve mathematics word problems dealing with advertising costs and column inches with at least 75% accuracy in the results.
   e. In a discussion of editorial cartoons, the student will be able to define the term, describe the incident or individual features in the cartoon, and analyze the cartoon according to content, motivation, and effectiveness of treatment.
   f. At the end of the unit, the students will be able to trace either orally or in written form the origination of a news story from the actual incident through the final edition that reaches the reader's

hands. At least five (5) operations that occur in the process should be mentioned.

g. The learner will be able to discuss in written form the importance of language skills to newspaper writing, mentioning specific skills and those work roles that employ them more heavily than others.

h. At the conclusion of the unit, the learner will be able to describe the raw materials of newspaper production -- the paper, ink, metals, etc. Students will be able to describe graphically in simple form the process by which newsprint is made from wood and water.

i. Students will demonstrate their writing skills by writing news stories of class events or field trips following the criteria of style, content, mechanics that pertain to news stories.

j. In the course of the unit study, the students will demonstrate their oral communication skills by selecting a classified ad from an assortment of employment ads, and reporting on it orally to the class, mentioning the kind of work offered, the preparation required and the hours and salary if given, and the procedure for application.

k. Following the unit study, the student will be able to solve word problems dealing with addition, subtraction, multiplication and division in reference to newspaper budget figures. The minimum criterion for performance will be 75% accuracy in the results.

l. In a written discussion the learner will be able to determine and analyze the newspaper's role in informing the public, including such items as the responsibility of the paper to its readers, the provisions to protect the free press under the Bill of Rights, the newspaper as an influencer of public opinion, etc.

B. CONCEPTS

1. The term newspaper simply means a paper that contains news. The word news means things or events that are new.
2. Journalism is the collecting, writing, editing and publishing of news or news articles through newspapers or magazines.
3. Journalism is a trade, a profession and an art.
4. A person whose occupation is journalism is called a journalist. Basically, he is a person who does the daily chronicling of history as it happens.
5. Many workers are involved in the gathering, reporting, writing, editing, publishing and distributing of the news.
6. Newspapers are a form of mass communication in which a printed record is made of events of both historical and human interest.
7. Most newspapers are printed on a regular basis with the most common schedules being daily, weekly and monthly.
8. There are many kinds of newspapers -- large metropolitan dailies, small city dailies, small town weeklies, community and special interest group papers to name a few.
9. The word "newspaper" is so much a part of our vocabulary that it seems

strange to realize that there was a time when it was not in use. Apparently the word was introduced accidentally in the Seventeenth Century.

10. A soung grasp of the English language -- especially spelling, punctuation, and sentence structure skills -- is necessary for positions in the journalism field.
11. Forerunner to the modern news reporter were the wandering minstrel and the town crier who sang and shouted their stories of people and events.
12. A reporter by definition is one who gathers news and makes a record of what he gathers.
13. "Who, what, when, where, why and how" are the most important words in a good news reporter's working vocabulary.
14. Today most newspapers require that job applicants for writing positions be college or journalism school graduates.
15. Like any other area of specialized activity, the newspaper field has a vocational vocabulary that is both picturesque and startling. Some of the terms and words have sprung from slang, association or crude symbolism.
16. Modern newspaper publishing is among the most highly organized and complex industries.
17. To make a reasonable profit from publishing the paper, a publisher must not depend upon paper sales alone. The revenue from newspaper advertising is probably the chief source of income for the publisher.
18. Advertising costs are based on column inch space and are adjusted according to the circulation of the paper.
19. The material in newspapers is divided into three (3) broad categories -- news, service and entertainment.
20. The category of news encompasses the news, activities in the fields of literature, art, music, theater, sports, finance, business, society and editorial comment.
21. Information and advice on home economics, fashions, cookery, care of children, medical advice, etc., is given under the service category.
22. Under the entertainment division comes the fiction, poetry, humor and comics. The comics have the most universal appeal of all newspaper features.
23. A great part of the news as it appears every day is closely related to news that has already been printed. For example, a Presidential campaign is a source of unlimited copy for months in advance of the election and for some weeks afterward.
24. Every newspaper regardless of size has three (3) distinct but interdependent divisions. First there is the editorial department which gathers the news, writes it, edits it, and comments on it.
25. Then there is the business department which administers the commercial side of the paper. It sells advertising, sells papers through the circulation department, collects all money, makes all purchases of equipment and materials. Also, this department pays rent, taxes, salaries and bills.

26. The third division is the mechanical department which carries on from the point where news becomes copy until it is delivered to the mail room. It sets up the type and proofreads it, makes the matrices and later the sterotypes and operates the giant presses.
27. The reference library at a newspaper is often called the "morgue" but it is often a busy place as cub reporters research stories and events for background material.
28. Several large news gathering organizations exist that assist newspapers in reporting world-wide news -- these are known as news agencies or news services. Two of the largest and best known in operation today are the United Press International (UPI) and Associated Press (AP).
29. Some newspaper material is syndicated for distribution to member newspapers. Comics, cartoons, features, columns and other material are among the materials contracted for by newspapers.
30. All advertising appearing outside the classified columns in a newspaper is known as display advertising.
31. Advertising rates depend upon the circulation of the paper, the position in the paper, the edition of the paper, the size of the ad, the number of times the ad appears, etc. Whether or not the ad is in color is an important factor in pricing it as printing in color is a more detailed process and therefore more expensive.
32. The makeup of the newspaper is the arrangement, location and the fitting together of the contents whether it be local news, foreign news, sports, finance, advertising or features.
33. Printing is one of the oldest arts. The Babylonians and the Assyrians used type in impressing hieroglyphics on their seals. In the 10th Century A.D., the Chinese practiced block printing, but not until the 15th Century did printing as we know it today come into existence. Johann Gutenberg is generally credited with the invention of movable type.
34. The first printed book in English (to bear a date) came from the press of William Caxton in November 1477.
35. Originally type was set entirely by hand, but mechanization of the process has made hand setting a very rare activity.
36. Practically all modern newspapers set their type on linotype machines which have keyboards that resemble typewriters. The linotype operator follows a piece of copy and picks out the appropriate letters on the keyboard, which, when struck, cause a matrix (mold) of brass to leave its compartment and travel by gravity to a container where it stands with other letters of the same line.
37. Once sufficient matrices or molds have been released by pressure on the keys to fill a line, a lever is thrown which moves them to another part of the machine where thin steel wedges known as spacebands push the words apart so that the length of all lines is equalized. When the matrices are in their new location, molten type metal, usually lead, is forced against them and, cooling instantly, becomes a solid slug, a line of type in one piece. A special lever on the machine returns the matrices to their proper compartments.

38. When the story and heads have been set they are assembled in the galley and rough proofs on narrow strips of paper are pulled and sent to be "proofed".
39. A standardized group of hieroglyphics is used by proofreaders to indicate corrections. These marks are so designed that they not only indicate a correction but the actual location or extent of the correction.
40. As the modern newspapers of large circulation are printed on high speed rotary presses, it is necessary to duplicate the flat sheet of type in a semi-cylindrical shell of metal called a sterotype.
41. The modern newspaper press can print, fold and count more than 50,000 papers an hour.
42. Two different type presses print the black ink and the colored ink editions of the paper, with the color press being the larger and more complex of the two.
43. In the making of a newspaper, the newsprint or paper upon which it is printed is next in importance to the news itself. The newsprint is made of wood fibers treated with water, then dried and shaped into thin sheets.
44. Many people are involved in the production of trees, the cutting, transporting, treating and processing them into newsprint.
45. Nowhere in all industry is timing quite so important as in the mailing room of a newspaper. Not only is the departing time of trains, inter-city buses, trucks and airplanes reckoned to the fraction of a minute but travelling time to stations, depots and airports must be measured to the split second.
46. Headlines serve two purposes -- to advertise the news and to bulletin or summarize it. There are several different methods of headline arrangement.

II. SUBJECT MATTER

A. DEFINITION OF PRINTING AND NEWSPAPER TERMS

1. The process, art or business of producing printed materials by means of inked type and a printing press or by similar means.
2. Printing is an art, a leading industry and one of our chief means of communication.
3. A newspaper is a typically daily or weekly publication containing news and opinion of current events, feature articles and usually advertising.
4. Newspaper printing and publishing can be identified and described under two clusters -- the communications and the graphic arts clusters because of the two main functions attributed to newspaper publishing -- gathering and communicating the news and the printing operations involved.

B. DATELINE HISTORY OF PAPER, NEWSPAPERS AND PRINTING

1. B.C. -- Stone, plastic clay, wood and metal used for making impressions of letters.

2. Later B.C. -- Papyrus made from plant fibers. Parchment and vellum later developed from animal skins. Papyrus gives us our word paper.
3. 200 A.D. -- Tsai Lun, a Chinese, discovered that a writing surface could be made from vegetable fibers beaten into a pulp and rolled into sheets.
4. 800 A.D. -- Arabs used linen and cotton rags for manufacturing paper pulp.
5. Early 15th Century -- Johann Gutenberg, a German, is credited with the invention of movable type. Supposedly one of the first books he printed was the Bible.
6. 1477 -- William Caxton prints first book in English language to bear a date.
7. April 17, 1704 -- The Boston Newsletter, edited by John Campbell is designated the first successful newspaper in America. Its editor is honored as the first vendor of news in America.
8. 1848 -- Associated Press, the first American news service, was formed by six New York City newspapers to split the cost of gathering news.
9. 1878 -- Joseph Pulitzer founds the St. Louis Post-Dispatch and is acknowledged as being in the front ranks of the "New Journalism."

C. RELATED FIELDS

Newspaper printing is one specialized area that can be identified under the printing and graphic arts cluster. In 1968, the largest division under the graphic arts cluster in terms of employment was newspaper printing and publishing.

Career areas that have some of the same technical characteristics as newspaper printing are magazine and book publishing, advertising matter and business form publishing, commercial or job printing, bookbinding, photoengraving and platemaking. Occupational areas related to the newspaper in aspects of communication are news agencies, radio and television news departments, news and current events magazines, newsletter publishers.

III. VOCABULARY WORDS AND TERMS

1. Apprenticeship
2. Banner head
3. Body
4. Boldface
5. Byline
6. Caxton, William
7. Composing Room
8. Copy
9. Deadline
10. Editorial
11. Face
12. Feature
13. Galley
14. Gutenberg, Johann
15. Headline
16. Journalism
17. Lead
18. Linotype
19. Makeup
20. Matrix
21. Morgue
22. Monotype
23. News article
24. Newsprint
25. Offset
26. Proof
27. Pulitzer, Joseph
28. Pulitzer Prize
29. Stereotype
30. Want Ad
31. "Yellow Journalism"

IV. OCCUPATIONS IN NEWSPAPER PUBLISHING

A. GENERAL DESCRIPTION

Most all jobs in the newspaper industry can be classified under the division headings: editorial, business and mechanical, according to the function performed in the job. Maintenance and clerical personnel are also associated with the newspaper industry.

B. JOB ENTRY AND PREPARATION

There are many different skill and education levels found in the newspaper industry as in most other publishing fields. Most positions in the editorial department on large metropolitan dailies require a college or journalism degree while smaller papers may not requre the degree, only general aptitude or related experience. Applicants usually begin as cub reporters and work their way through the ranks depending upon their ability and skill. Most editors have arrived at their positions through this procedure.

"Apprenticeship is a common method of entry into the mechanical and technical divisions of the industry. In some instances, it is the only means by which one may be trained to become a journeyman (skilled worker) in a unionized shop."* Apprenticeships in the printing trade usually last from four to six years and cover various areas of that field. Included in the training are classroom or correspondence study in related technical subjects plus on-the-job training. The minimum education requirement for most craft occupations is a high school education or its equivalent.

Occupations in the business and clerical departments also require a number of skill and educational preparations. A high school or business school education is necessary for most clerical and secretarial jobs while a college degree may be required for executive, accounting and sales positions.

C. GENERAL REQUIREMENTS

Apprenticeship applicants in the technical trades are generally required to be between 18 and 30 years old and must pass a physical exam. A good knowledge of the mechanics of the English language -- spelling, grammar and punctuation -- is important as is the knowledge of basic math. Manual dexterity and average strength are needed for these jobs in the craft occupations.

Knowledge of the mechanics of the language is necessary for positions in the editorial department where workers are concerned with the writing and editing of the news. A flair for the journalistic news style of short, fact-filled sentences precise vocabulary and detached viewpoint would be necessary for writing positions.

* Occupational Outlook Handbook, page 501.

D. WORKING CONDITIONS AND BENEFITS

Working conditions vary depending upon the size of the newspaper plant and the assignement area. Large metro papers that publish several editions usually have different shifts with printing workers having to work night, weekend and holiday schedules. Wages and salaries vary with the locale, the shift, the plant and the shop -- whether union or non-union etc.

Reporters, correspondents and other writers may work irregular hours and may be forced to work on nights, holidays and weekends. If an important news story or emergency arises, they may have to work overtime occasionally. Depending upon the writer's job, travel may be involved for correspondents and special reporters who must follow their stories around the world sometimes. Some amount of danger might be involved for reporters who must write about natural disasters or battles and who must be on the scene to get an accurate and first-hand report of the action.

Working in the newspaper field is an exciting and rewarding career for those who enjoy working with language. Anyone who likes to be involved in the drama of current events, who likes to be involved with different places and people can find a job in the newspaper field whether his tastes run to writing or the printing craft areas of the publishing field.

E. OCCUPATIONAL LISTING

1. Business
   - a. Accountant
   - b. Advertising Salesman
   - c. Delivery Men
   - d. Mailer
   - e. Personnel Director
   - f. Publisher
   - g. Purchasing Agent
   - h. Secretary
   - i. Truck Driver
2. Editorial
   - a. Ad Layout Man
   - b. Ad Copy Writer
   - c. Amusements and Entertainment Editor
   - d. Art Editor and Critic
   - e. Artist
   - f. Beat Reporter
   - g. Book Reviewer-Editor-Critic
   - h. Business and Financial Editor
   - i. Business Reporter
   - j. Cameraman
   - k. Cartoonist
   - l. Church Editor
   - m. Classified Ad Clerk
   - n. Columnist
   - o. Copyboy
   - p. Copycutter
   - q. Copyreader
   - r. Correspondent
   - s. Editorial Cartoonist
   - t. Editorial Clerk
   - u. Executive Editor
   - v. Farm Editor
   - w. Fashion Editor
   - x. Foreign Correspondent
   - y. Librarian
   - z. Managing Editor
   - aa. News Editor

bb. Photo Editor
cc. Photographer
dd. Proofreader
ee. Reporter
ff. Rewrite Man
gg. Society Editor
hh. Sports Editor
ii. Sports Photographer
jj. Sports Writer
kk. Feature Writer
ll. Food Editor

3. Mechanical
   a. Hand Compositor
   b. Layout Man
   c. Machinist
   d. Linotype Operator
   e. Photo Engraver
   f. Plate Maker
   g. Press Man
   h. Retoucher
   i. Teletype Operator
   j. Type Setting Machine Operator

V. MOTIVATION

A. Show an appropriate film or filmstrip on newspapers and their relation to the community.
B. Plan a bulletin board display of different types of newspapers or newspaper articles. Have samples from local papers, metro Atlanta papers and any others that are available.
C. Make display of books and pamphlets that relate to the newspaper field.
D. Initiate a discussion of the importance of newspapers to the community.
E. Plan and give a brief questionnaire concerning newspaper reading habits -- discuss and chart the results
F. Invite a resource person into the classroom to discuss his activities with the class.
G. Distribute copies of newspapers and discuss the different parts and departments of the paper. Try to determine the functions of each and which ones are the most popular.
H. Have children make drawings of different phases of the newspaper that interest them.

VI. STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Motivation activities.
2. List ideas for future development. Work with class to develop plans for projects, resource persons, field trips, etc.
3. Begin work on project ideas -- identifying sources of materials, supplies, assistance, etc.
4. Collect pictures, materials, newspapers into a central file for reference. Compile materials into a notebook or scrapbook.
5. Give oral or written pre-test to determine present knowledge level.

B. RESEARCH ACTIVITIES

1. Divide class into teams or committees to do research on topics of interest.
2. Make wall charts on vocabulary words, occupational listings, information that is needed. Illustrate with clippings from the newspaper, pictures, and student drawings.
3. Invite resource person into the classroom to discuss activities with students.
4. Class could begin to divide into teams to plan publication of newspaper. Different members could arrange for the news gathering, the duplication, or printing of materials, the distribution, etc.
5. Make arrangements for field trip into industry.
6. Dramatize phases of newspaper operation and have individual students role play the different positions.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Clip different types of articles from the newspaper to compare the writing styles of each. Compare a straight news article and a feature story to see if sentence structure, sentence length, diction, etc. differ. Compare news writing with the composition, descriptive writing done by students.
   b. After field trip, students could write news report of the trip, mentioning aspects of particular interest.
   c. Practice letter writing skills by writing letters of appreciation for field trips or letters requesting information.
   d. Make charts of unit vocabulary words to use in a classroom. Have students make lists of words for individual notebooks. Spell and define unit study words.
   e. Develop oral communication skills by having students select an ad from an assortment of classified employment ads. Using the ad, the student could report orally, answering the following questions: What skills (or knowledge) is involved? Would the student enjoy that job? What preparation is necessary for the position? What would procedure for application be?
   f. Do library research on famous newspaper men -- their lives their contributions, their activities, etc. Have individual oral or written reports on research.
   g. Distinguish between different newspaper articles as to function, content, interest, technique, style, etc. Practice writing different types of articles -- straight news, feature, sports story -- in preparation for publication in class or school newspaper.
   h. Plan publication of paper -- organize into departments (News, Sports, Society, Entertainment, etc.) and plan format of paper. Different interest groups could handle the various assignments.
   i. Initiate a discussion of the importance of language skills to newspaper

workers -- (spelling, punctuation, organization of ideas, sentence structure, work choice). Mention proofreader and spelling, the reporter and sentence structure, etc.

j. Use the "You Were There" approach to select incidents to report on. Events in ancient and modern history could be excellent source material for news reporting.

k. Have each student keep an individual notebook of newspaper articles he has clipped and read. Try to have one example from each of the several newspaper sections -- sports, editorial, news, features, columns, cartoons, society, etc.

l. Practice interviewing skills that a reporter might use. Utilize these skills in role playing, field trip conversations and talks with resource people.

m. Read books for book reviews section in class paper. Have individuals alternate handling the assignment of reading a book and writing a review to be printed.

2. Math

a. Work problems using multiplication and division skills in dealing with advertising costs in newspapers. (Example: If advertising costs $12.64 per column inch, one color, in the Sunday JOURNAL CONSTITUTION and there are 172 column inches per page, how much will it cost Rich's to run eight, full pages of one color ads?)

b. Initiate a discussion of the importance of accurate measuring to the page layout man. Use an accurate metal rule to measure column length and width on a page. Talk about the arrangement of items on a page, -- the spacing, the line length, etc.

c. Discuss the costs involved in operating a paper -- cost of materials, newsprint, ink, equipment and maintenance of facilities, salaries, taxes, transportation and distribution costs , etc. Try to determine paper's chief source of income -- is it paper sales or advertising?

d. Work word problems utilizing all skills--addition, subtraction, multiplication and division -- in figuring newspaper budget. Add costs of supplies and materials for printing, multiply revenue from advertising and paper sales, subtract costs and operating expenses, etc.

e. Devise running tables for column inch figures and advertising costs.

f. Role play various occupations in the newspaper field -- the circulation department, office personnel, business department, etc. -- and enact the various math operations related to each position.

g. Discuss the role of math in public opinion surveys published in newspapers. How do the pollsters determine the number of people to survey? What percentage of the population do they represent? How valid are the cross section figures that result?

h. Conduct an informal survey of class and other classes to determine (1) What percent reads all the paper, (2) What percent reads the sports pages, (3) What percent reads the comics, (4) What percent reads two or more papers or magazines a week and other related items. Chart the results.

3. Social Studies
   a. After defining the terminology, initiate a class discussion concerning different types of newspapers -- metro dailies, small dailies, weeklies, special interest items (news, features, editorials, etc.) and are arranged differently according to their function.
   b. Trace the history of newspapers in the United States -- have teams investigate different areas, different inventions, names in the history, etc. Make reports on findings, design bulletin boards, notebooks.
   c. Make bulletin boards on events in the development of paper and printing, including Babylonian and Assyrian papyrus paper. Chinese printing, Gutenberg's press and other items of interest. Use pictures reports, charts, to illustrate findings.
   d. Investigate the various type faces used in printing newspapers -- Gothic, Old English, Script, Boldface, etc., and the various eras from which they have been drawn.
   e. Select a number of editorial cartoons from various papers, define these according to content, motivation, etc. Analyze the content skills, techniques, message, effectiveness of these cartoons, Discuss the cartoonist's responsibility in interpreting the news. Use news articles to inspire the students to design their own cartoons.
   f. Determine and analyze the newspaper's role in informing the public of news, events, happenings, etc. Talk about the responsibility of the newspaper to its readers. Discuss the provisions to protect the free press under the Bill of Rights and compare the freedom of the press under Colonial times and under the Constitution.
   g. Select sample news articles and editorials, then define each according to type, purpose, content and objectivity. Discuss the similarities and differences between the two. What responsibilities are involved in the straight reporting of news? What additional freedom does the editorial approach afford?
   h. Discuss the various forms of mass media and compare the newspaper as a means of reporting the news with radio, television and magazines. What advantages/disadvantages does each form have?
   i. Trace the origination development of a news story from incident through final copy and printing in newspaper to reader's attention over the breakfast table. Students might role play as famous people or events and then trace their involvement through news gatherings, etc.
4. Science
   a. Discuss and illustrate the process of making paper (newsprint) from water and wood. Mention the various materials that have been used through the years to make paper.
   b. Research the making of ink used with the newsprint. Talk about the different kinds of inks that have been used -- berry juice, fruit and vegetable dyes in inks, etc. Do experiments with fruits or berries to see if usable ink can be made.

c. Discuss the newspaper's role in providing scientific, medical and health news to public. Identify various parts of the paper that are devoted to such news -- the weather report, medical advice columns, food and nutrition pages. Questions that might arise include: Why does the newspaper provide such information? Is it helpful to people? How could those sections be improved or should they be removed entirely?

d. Discuss the process carried out in the linotype machine in the making of a line of type. Mention the types of metals involved (brass, lead) and describe their characteristics in relation to their function in the process.

e. Initiate a discussion of the science and health skills and information used by newspaper workers -- photographers, developers, photo engravers must know about chemical solutions and metals; craft printers must know about metals and their characteristics, temperature levels and paper; maintenance workers must know about personal temperature and ventilation needs and standards of sanitation and health.

f. In discussing states of matter, mention some examples of different states to be found in the newspaper plant. Relate the ways in which some materials undergo several different states in the process. (Paper, metals, etc.)

5. Art

a. Students could design and illustrate comics for the newspaper. Also, they could try to do editorial cartoons based upon some topic of current interest.

b. Select sample display advertisements from the paper, both those in black and white and those in color. Discuss the composition and arrangement of the pictures, art work and copy of the ad. Talk about what colors and arrangements are "eye-pleasing" and which are not.

c. Design a colorful mural illustrating different phases of the newspaper industry.

d. Use newspapers to make collages. Cover them with a coat of clear or orange shellac.

6. Music

a. Identify and discuss the role of the music/entertainment editor on the newspaper. Discuss what qualifications are necessary for a person in that position. Try to find reports or critiques of concerts operas, etc., and review the contents.

b. Select appropriate songs or recorded music and use them during work and activity periods.

D. CULMINATING ACTIVITIES

1. Have individual or group research reports. Have reporting members make notebooks of findings to save for future reference.

2. Put newspaper into operation. Coordinate all phases to publish issues to share with other classes in the school.
3. Make bulletin board of collected materials and research.
4. Take planned field trip into industry, preceeded by discussion of expectations and followed by discussion of impressions, observations, etc.
5. Have various resource persons into the classroom.

E. FOLLOW-UP ACTIVITIES
1. Give written post test to determine changes, if any, in knowledge level.
2. Publish subsequent issues of the newspaper on special occasions, holidays or times of special interest.
3. Give questionnaire concerning newspaper reading habits -- compare the results with those of the questionnaire given at the opening of the unit study.

F. SUGGESTED HANDS-ON ACTIVITY
1. Organize committees to plan a class or school newspaper. Have different class members to work in the various departments of news gathering, writing, editing, printing, proofreading, final printing, and distributing the papers. Publish at least one issue and try to continue publication.

VII. MATERIALS, SUPPLIES AND EQUIPMENT

A. Typing Paper
B. Metal Ruler
C. Newspapers
D. File Folders
E. Butcher Paper
F. Tempera Paint
G. Construction Paper
H. Scissors
I. Poster Paper
J. Ditto Sheets
K. Tacks
L. Stapler and Staples
M. Advertising Cost Catalog
N. Type Face Catalog
O. Library Books
P. Typewriter (if possible)
Q. Shellac

VIII. EVALUATION

A. SELF-EVALUATION
1. Did I plan effectively, utilizing methods and materials wisely?
2. Did I generate the maximum level of interest through motivation techniques?
3. What degree of participation was generated by this unit?
4. Did I maintain a classroom atmosphere conducive to learning?
5. Did I plan activities effectively to include each child to the best of his ability?
6. Which activities excited the most enthusiasm and interest in the class?
7. Did I program activities so as to individualize instruction?

B. OBSERVATIONS OF THE CHILD

1. Observe the flexibility of the individual role interaction within the group.
2. Observe the child's communication skills both as an individual and as part of the group.
3. Observe for evidence of individual research and task completion.
4. Look for evidence of social interaction skills -- does the child share materials, take turns, communicate well with his peers?
5. Did the children exhibit any change in attitude toward their school-related activities? Any change in their attitude toward the world of work?

C. WRITTEN TEST (PRE AND POST IF DESIRED)

1. The learner will spell and define a list of words given orally by the teacher.
2. Students will describe the duties and preparations of a number of workers in the field of journalism.
3. Given a set of workers and three (3) division headings, the student will assign each worker to a category according to work role characteristics.
4. Students will discuss the role of the newspaper in mass communication, and compare its place and responsibility to other forms of mass media.
5. The learner will trace in simple form the procedure for reporting, writing, editing, printing and distributing of a news story.
6. In either a written or oral discussion, the student will identify and describe those special communication skills needed by newspaper writers.

IX. *SAMPLE QUESTIONS

1. Do you regularly have a daily newspaper in your home? Yes__ No __
2. How much time do you spend each day reading a newspaper?
   ___Less than 5 minutes ___15 to 30 minutes
   ___5 to 15 minutes ___Over 30 minutes

3. Which parts of the paper do you most often read? (Number in order of interest. Do not mark those you never read.)

__Sports	__Radio and Television	__News - Local
__Editorials	__Political Cartoons	__News - National
__Comics	__Advice Columns	__News - International
__Headlines	__Weather News	
	__Women's News	
	__Movie Section	

4. In your opinion, newspapers are:
   ____Too difficult to understand ____Easily Understood
   ____Usually understood

*Developed by Mrs. Ruth Hull - Mt. View Elementary School

5. How Often do you read the advertising?
   ___Never ___Sometimes ___Usually
6. What do you think a full-page ad costs for one day?
   _____or_____don't know.
7. Have you ever written a letter to a newspaper? YES__ NO__.
8. Have you ever written a story or poem that was published in the newspaper?
   YES___ NO___
9. What is your favorite newspaper?_____
10. How necessary do you think freedom of the press is in a democracy?
    ___Very necessary ____Quite Necessary ___Not necessary.
11. Can you name any workers who are necessary in the publishing of a newspaper? Name as many as you can and tell what kind of work you think they do.

X. RESOURCE MATERIALS

A. TEACHING AIDS

1. Films
   a. "Getting the News"
   b. "Mightier than the Sword"
   c. "Paper and Pulp Making"

CATALOG OF CLASSROOM TEACHING FILMS FOR GEORGIA SCHOOLS # 9, 1968-71.

2. Posters
   a. Modern Workers Posters, Set II, # 573

INSTRUCTOR CURRICULUM MATERIALS, OFFICE SALES AND SERVICE CATALOG

3. Tapes
   a. "Freedom of Information"
   b. "Johann Gutenberg -- Magic Man of Mainz"
   c. "Newspapers: Better than Ever?"
   d. "Printer's Ink"
   e. "The News Magazine"

CATALOG OF CLASSROOM TEACHING TAPES FOR GEORGIA SCHOOLS # 5, 1969-71.

B. AVAILABLE TITLES IN JOURNALISM MATERIALS

1. "Editors," "Journalist," "Newspaper Editor," "News Photographer," "Newspaper Reporter"
   Careers
   Largo, Florida 33540
2. "How To Be a Columnist on a New York Paper," "Newspaper Reporter," "Weekly Newspaper Editor"
   Chronicle Guidance Publications
   Moravia, New York 13118

3. "Journalism Careers"
Opportunities, Sigma Delta Chi Society
35 East Wacker Drive
Chicago, Illinois 60600

XI. BIBLIOGRAPHY

A. Arnold, Elliott; NOSE FOR NEWS -- THE WAY OF LIFE OF A REPORTER, The Way of Life Series, Row, Peterson, Chicago 1941.

B. Bonner, M.G.; THE REAL BOOK ABOUT JOURNALISM, Garden City Books, Garden City, New York, 1960.

C. Botter, David; NEWS REPORTERS AND WHAT THEY DO, Franklin Watts, Inc., New York, 1959.

D. Burt, Olive W.; PETER'S STORY GOES TO PRESS, Henry Holt and Company, New York, 1943.

E. Floherty, John, YOUR DAILY PAPER, J.B. Lipincott Company, Philadelphia, 1938.

F. Parsons, Tom; FIND A CAREER IN JOURNALISM, G. P. Putnam's Sons, N.Y., 1959.

G. Radder, Norman and John Stempel; NEWSPAPER EDITING, MAKE-UP, AND HEADLINES, McGraw-Hill Book Company, Inc., New York, 1942.

H. Stein, M.L.; YOUR CAREER IN JOURNALISM, Julian Messner Publishers, N.Y. 1966.

ADDITIONAL SOURCES

D.O.T. OCCUPATIONAL OUTLOOK HANDBOOK
SRA OCCUPATIONAL BRIEFS

THE HOSPITAL

Careers in Health

Grades 5 & 6

Teachers Resource Guide

INTRODUCTION TO THE HOSPITAL

The health career cluster is one of the most rapidly growing areas in the services field and the hospital at the center of the medical field exemplifies the characteristics of this cluster. Most of all the occupations that can be identified in the medical services field are found in the hospital.

Involving upper elementary students in a study of the hospital allows them to examine the characteristics of the field; apply their subject matter to hospital-related activities; and to identify occupations and experience their responsibilities and duties through role playing situations.

I. OBJECTIVES AND CONCEPTS

A. OBJECTIVES

1. Teacher Objectives
   a. To broaden the base of student experiences by incorporating content skills into activity-centered learning situations.
   b. To provide students experience in observation, cognitive processes and verbalization of ideas.
   c. To stimulate appreciation of various workers and their roles in society.
   d. To stimulate social interaction skills as the individual functions within the group.
   e. To provide opportunities for both individual initiative and group processing.
   f. To give the child additional opportunities for identifying his self-characteristics in relation to those of the medical services field.
   g. To encourage and provide for students a measure of personal success through individualized instruction methods.
   h. To provide additional opportunities for student involvement in decision-making situations.
   i. To stimulate student pride in achievement and the worth of their work.
2. Learner Objectives (Behavioral)
   a. At the end of the unit study, the learner will be able to spell and define correctly a minimum number of vocabulary terms associated with the unit. He will demonstrate his understanding of them by using them correctly in the context of compositions, oral reports and conversation.
   b. In a role playing situation, the learner will demonstrate his capability to take correctly vital sign information such as pulse rate, body temperature and blood pressure. Also, he will be able to describe and demonstrate clearly basic first aid practices such as treating snake bites, stopping open bleeding and giving artificial respiration.
   c. By the end of the unit study, the learner will be able to name a minimum number of workers in the medical services, describe their duties responsibilities and job characteristics briefly according to the six (6) classifications of information in the Occupational Outlook Handbook.
   d. The learner will demonstrate his mathematics skills by working percentage problems with figures related to hospital services and workers. The minimum standard of performance will be 75% accuracy in the results.
   e. Through writing reports and compositions, learners will demonstrate their grasp of penmanship techniques, dictation, spelling and

paragraphing skills, development of thought, sentence structuring continuity and punctuation skills.

f. In a written exercise, the learner will discuss briefly the history of the hospital, citing at least four (4) developments in medical services to support his discussion. Also, the learner will include examples either to support or refute the statement that the degree of civilization of a culture is closely correlated with the degree of sophistication of its medical services.

B. CONCEPTS

1. According to the dictionary, a hospital is an institution providing medical or surgical care and treatment for the sick and injured.
2. Our English word "hospital" comes from the Old French hospitale which was derived from Latin. "Hostel" and "Hotel" are also derived from the same word which referred to the houses built for the sick and weary traveler.
3. Some of the earliest known hospitals were the healing temples of ancient Egypt, the public hospitals of Buddhist India and Mohammedan Egypt, and the sick houses of Israel. Early physicians were both priest and magician since sickness and disease were thought to represent the work of evil spirits and could also be brought on by infractions of religious rules.

*4. The evolution of the modern hospital is usually associated with the advent of Christianity. Thus church control over the hospital was established -- a practice that carried over to the monastery hospitals, of England. Henry VIII's Reformation Parliament dissolved the English monastery system between 1536-39, dissolving the hospital system as well.

*5. No other hospital system existed and a serious problem caused by the lack lasted for some years until the voluntary private, nonprofit hospital system came into existence.

*6. Our American hospital system is based in part upon the English model of voluntary private, nonprofit institutions.

*7. Organized hospitals in America did not arise until more than a century had passed following the first colonial settlements in the country.

*8. One of the influences that stimulated the founding of the American hospital was the process of urbanization. This concentration of population into urban centers focused upon the need for health care in a specific area.

9. Today hospitals may be either general, that is, accepting all types of patients with all types of diseases and injuries; or specialized, accepting only patients of a certain age, sex, disease or injury.

10. Many workers are involved in the operation of the hospital -- some are clerical personnel, some work as maintenance workers but the largest groups function as health service personnel.

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* Hospitals, Doctors and the Public Interest, ed. John Knowles, M.D.

11. Persons in these health service careers may work both directly and indirectly with patients in the hospital.
12. Doctors, nurses and pharmacists are the most "visible" health service workers in the hospital but there are many other professional and non-professional personnel who support the work of the doctors, nurses and pharmacists.
13. Some of these support personnel are X-ray technicians, practical nurses, aides, medical technologists, orderlies, therapists, laboratory technicians, radiology therapists, medical records librarians, dietitians, cooks, laundry personnel and administrators.
14. The educational skill and preparational requirements for work in the health field are as diverse as the health occupations themselves. For example, professional health workers such as physicians, nurses, dentists, pharmacists and others must complete a number of years of pre-professional and professional college training and must be licensed through a state licensing examination, while other health service occupations may be entered with little specialized training.
15. Most all hospitals, regardless of size, have some of the same departments and provide some of the same services. The most common service departments in hospitals are the surgical division with operating and recovery room facilities; labor and delivery room with nurseries for the infants; individual and group patient care facilities; a pharmacy for the dispensing of drugs; kitchens for preparation of patient and staff meals; and usually, an emergency treatment room or outpatient clinic.
16. State and county governments provide funds for public hospitals that treat all citizens. Some private hospitals do exist that are not connected with government but are part of a medical school or university complex, funded by a church or a private foundation.
17. Some hospitals operate primarily as research centers for disease study and identification. Such hospitals accept and treat patients as part of their research activities.
18. Scientific research has yielded many new discoveries for medicine and medical treatment. New methods of treating burns, new uses of atomic power -- all these are developments brought about by science.
19. Some countries such as England operate a socialized medical system in which doctors work under supervision of the government and relinquish their private practices.

II. SUBJECT MATTER

A. Definition of Terms.

1. Health: The state of an organism functioning normally without disease or abnormality.

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* American Heritage Dictionary

2. Hospital: An institution providing medical or surgical care and treatment for the sick and injured.
3. Patient: One under medical treatment.
4. Doctor: A person trained in the healing arts and licensed to practice; especially a physician, surgeon, dentist or veterinarian.
5. Nurse: A person trained to care for the sick or disabled under the supervision of a physician.

B. SUGGESTED VOCABULARY

1. Vocabulary
   a. Stethoscope
   b. Therapy
   c. Wristbands
   d. Sterile
   e. Anesthetic
   f. Blood Pressure
   g. Autoclaves
   h. Emergency Room
   i. Recovery Room
   j. Pharmacist
   k. Fluroscope
   l. Dietitian
   m. Interns
   n. Residents
   o. Operating Room
   p. Scrub
   q. EKG
   r. Blood Banks
   s. Outpatient
   t. Traction
   u. Pathology
   v. Pulse Rate

C. EARLY HISTORICAL HAPPENINGS IN MEDICINE

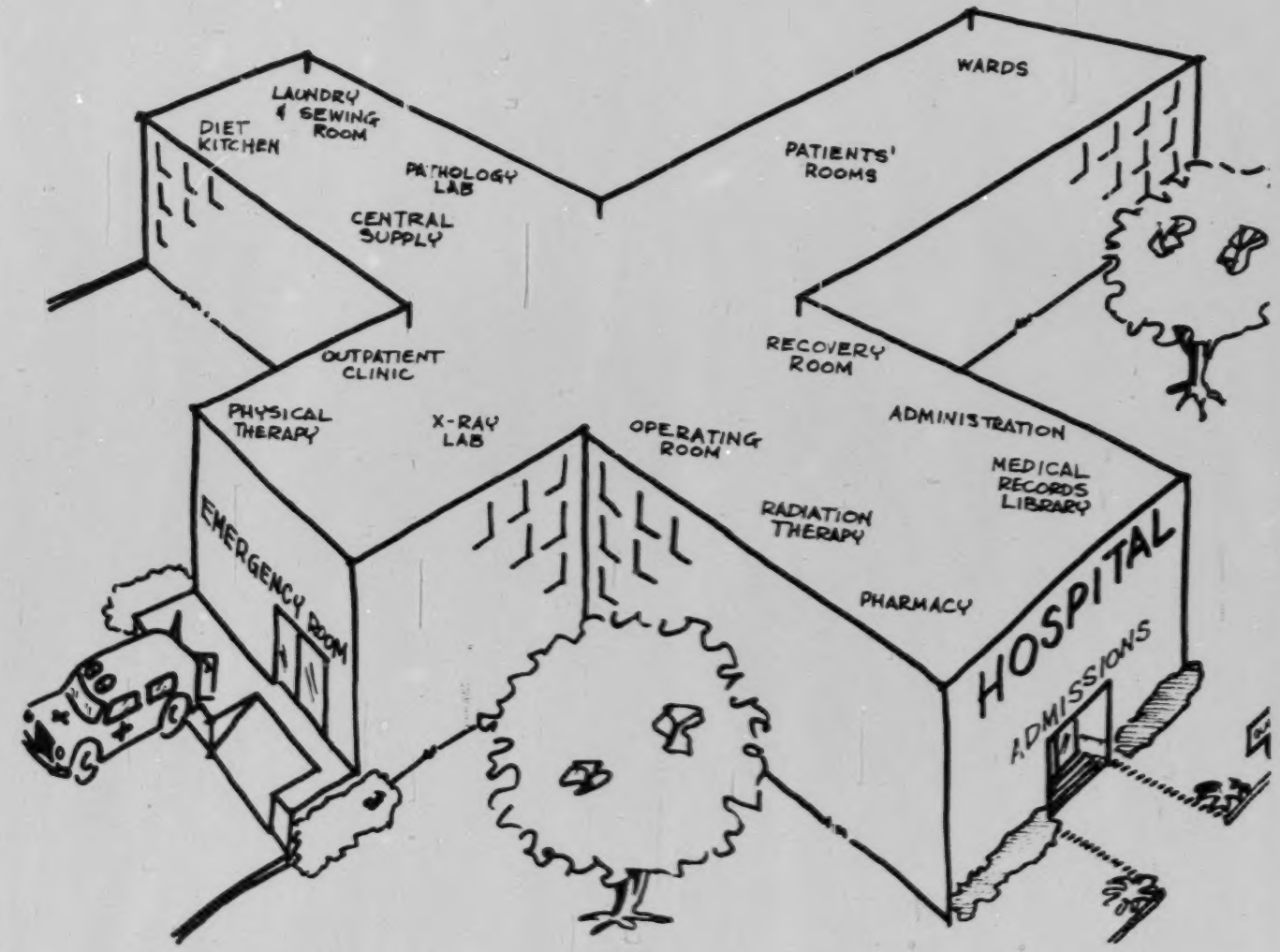
1. In prehistoric times, illness and disease were attributed to demons and evil spirits that influenced a person. Since disease was thought to be caused by magic and mysterious evil forces, it was no wonder that people turned to "medicine men" and their magic to combat these influences.
2. As people grew more and more civilized, they began to use certain remedies for sickness and diseases. The ancient Babylonians used minerals, water and herbs in their treatments. The early Egyptians also began to view sickness and disease as having natural origins and attempted to treat them as such.

3. One of the earliest incidences of surgery was found in the Hindu civilization in India. They Hindus became very good surgeons and performed many different types of operations.
4. Hippocrates of Greece has been given the name of Father of Medicine due to his work with medical treatment based on careful observation of the patient's symptoms and a diagnosis based on this observation. This man has given his name to the Hippocratic Oath which has long served as the oath of the medical profession. He laid the basis for much of modern medical treatment.

D. RELATION OF THIS AREA TO OTHER OCCUPATIONAL FIELDS

1. The hospital, as part of the health services career field, is an area with many different types and levels of jobs. The greatest percentage of occupations centered in the hospital are concerned with the care and treatment of the patient.
2. Health service careers are part of the cluster of service -- oriented occupations and their related characteristics should be discussed.

E. HOSPITAL ORGANIZATION CHART (SEE NEXT PAGE)


WARDS
LAUNDRY & SEWING ROOM
DIET KITCHEN
PATHOLOGY LAB
PATIENTS' ROOMS
CENTRAL SUPPLY
OUTPATIENT CLINIC
RECOVERY ROOM
PHYSICAL THERAPY
X-RAY LAB
OPERATING ROOM
ADMINISTRATION
MEDICAL RECORDS LIBRARY
RADIATION THERAPY
EMERGENCY ROOM
PHARMACY
HOSPITAL
ADMISSIONS

III. UNIT OCCUPATIONAL INFORMATION

A. GENERAL DESCRIPTION

A wide variety of jobs exist in this field which require a variety of preparations and skill levels. One basis of categorizing the careers in this field might be the degree of contact with the patient. For example, nurses, doctors, aides, therapists, orderlies, practical nurses, interns, counselors and social service workers are generally in direct contact with the patients while others such as technicians, pharmacists, dietitians, pathology lab technicians do not work directly with patients. Nevertheless, their work is vital to the care and treatment of hospital patients.

B. JOB ENTRY AND PREPARATION

Entry into the medical field may be made in a number of ways depending upon the job desired. Professional jobs (nurses, physicians, therapists, counselors, dietitians, anestheseologists, pathologists and others) require either college or special intensive training and state licensing. On the other hand, occupations that are non-professional (ambulance drivers, nurses' aides, orderlies, laundry workers, kitchen workers, supply personnel) may not require anything more than a basic education and on-the-job training for entry into the field.

C. GENERAL REQUIREMENTS

Basic requirements for workers in this field would be patience, the desire and ability to work with people, an interest in the medical and health field and the ability to remain calm during emergencies or crises. In this field as in any other, workers must be of good health and have normal vision and hearing abilities.

D. WORKING CONDITIONS AND BENEFITS

Obtaining work in the health services field is usually easy if the applicant is a qualified person. The growing population and expanding medical services are two factors that almost guarantee employment for qualified personnel in the future.

Working conditions depend upon the assignment but generally it can be said that medical service workers must expect to work shifts, night, weekend and holiday hours. Salaries vary also with the assignment, whether the job is in a public or private hospital, the training and ability of the workers, etc.

E. OCCUPATIONAL LISTINGS

1. Nurse
2. Nurse Aides
3. Laboratory Technician
4. Laundry Personnel
5. Orderly
6. Switchboard Operator
7. Information Desk Personnel
8. Admissions Desk Worker
9. X-Ray Technician
10. Fluroscope Technician
11. Doctor
12. Medical Records Librarian
13. Dietitian
14. Kitchen Help (Cooks)
15. Secretary
16. Intern
17. Residents
18. Administrator
19. Student Nurse
20. Practical Nurse
21. Pathologist
22. Pharmacist
23. Cleaning and Maintenance Staff
24. Ambulance Driver
25. Ambulance Attendant
26. Physical Therapist
27. Occupational Therapist
28. Clinical Social Worker
29. Speech Pathologists and Audiologists
30. Medical Record Technician and Clerk

IV. MOTIVATION ACTIVITIES

A. Initiate a discussion of the numerous "doctor and hospital" shows on television. Mention some of the personnel seen and try to get examples of other health service workers from the class. Talk about the activities seen on the shows, the duties of the workers, their preparations, etc. Raise questions concerning the realism of the shows, and possible reasons for their widespread popularity, etc.

B. Obtain and display any available medical, surgical and first aid equipment. Use the equipment to start a discussion of the uses of the instruments and the various people who are involved with them.

C. Select an appropriate film such as "Health in Our Community" and show it to the class to create student interest. Hold a discussion period after the film to answer student questions.

D. Have an oral discussion perid in which students are encouraged to share real, personal experiences related to health service workers and the hospital.

E. Make a display of books and other printed materials concerning health service careers centered in the hospital. Encourage students to use them during their free time.

F. Invite a resource person to visit the classroom to share experiences with students. Precede the visit with a briefing session in which questions for

visitor are prepared.

G. Begin work on a bulletin board display of pictures and posters related to health service careers centered in the hospital. Individuals or groups of students could bring in materials.

H. Give a Personal Interest Inventory to determine student interests. Use the findings to initiate a discussion related to student interests, individual characteristics and abilities.

V. STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Begin motivation activities and use throughout the unit to maintain student interest.
2. Introduce topics for individuals and groups to research. Some areas of interest might be acupuncture, nuclear medicine, socialized vs. private medical care, the use of para-professionals as aides, the doctor's changing role, etc. Current newspapers and magazines would be good sources of information.
3. Identify areas of interest in the unit study. Allow class to begin breaking into groups to work on project ideas and to identify sources of materials and assistance.
4. Develop a format for making reports of research findings. Talk with the class concerning the kinds of facts and ideas that should be included the best ways to present them, etc.
5. Have students begin reading books related to this field and then report on them orally in written form to the class.

B. RESEARCH ACTIVITIES

1. Begin investigations into the occupational areas of the field using library books, pamphlets, SRA briefs, the Occupational Outlook Handbook, and other sources. Make lists of the various workers identified in the health services cluster and discuss the characteristics of the jobs -- whether the work is highly active or mainly sedentary, whether it involves working mostly with people or things, etc.
2. After research activities are underway, begin working on an organizational chart of the hospital using reference materials as a guide. Begin listing some of the various workers under the department headings.
3. Invite additional resource persons into the class to talk with students. Prepare questions for the resource person prior to the visit.
4. Individuals and groups could begin making reports to class. Students could be responsible for making visual aids to use in their presentations and the talks could be taped for future reference.

5. Students could work on their own book depicting the activities carried on in the hospital related to a patient's admission to the hospital, his treatment and eventual discharge. Different committees could be responsible for art work, vocabulary terms, text, etc.
6. Plan field trip into site. Have discussion period during the planning session about the different departments of the hospital, the activities carried on there, the personnel involved with those activities, etc.
7. When occupational research is begun and students have become more aware of workers and their responsibilities, introduce role playing activities. Devise different situations in which various hospital activities are depicted and allow students to assume these roles.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Practice oral reporting skills by having individuals make reports of their research projects. Provide tape recorders to allow students to prepare for the reports.
   b. Put composition and paragraphing abilities into practice by writing letters for information and materials to companies and training centers.
   c. Allow class members to work in groups to write short skits depicting hospital activities. Group members can then plan and produce these skits in role playing activities.
   d. Initiate a discussion about the language arts and communication skills important to workers in the health services cluster -- handwriting, spelling, reading, verbalizing, speaking clearly and giving clear directions are among these skills. Role playing situations could illustrate the need for these abilities.
   e. Students could make individual notebooks of words, compositions, reports, etc. and keep them up to date during the unit. Also, wall charts of vocabulary terms and occupational titles could be made. Different groups of students could be responsible for making them.
   f. Small groups of students could produce their own book depicting a patient's visit to the hospital. Some could work on the text; some on the vocabulary and research information needed; and others could do the art work and assembling of the pages.
   g. A similar activity could be done with individuals' reports on occupations. These written reports could be compiled into a book form to keep for later use.
   h. Book reports could be made on titles related to this field.
   i. Students could work on unit vocabulary words -- learning to spell them correctly and using them in sentences and compositions. Wall charts of words could be made.

2. Social Studies
   a. Define terminology and begin research into the development of medical services, discuss the growth of medical services (the hospital) in the struggle to overcome illness and disease as an indicator of the level of development of a cultural group. Prepare time lines, charts or dioramas to illustrate the important developments in the history of the hospital.
   b. Do research to make comparisons and contrasts with today's hospitals and those of one hundred years ago. One student group might be interested in investigating the hospital system as it existed in Cobb County a century ago. A role playing situation might be related to this activity.
   c. Use the teaching tape, "Socialized Medicine", to introduce the concept of a supervised medical system -- compare it to the private system we have now. Have students do research on this topic and then present their findings, evaluations and/or recommendations in a debate or question and answer student panel activity. Magazines and current books would be good sources of information.
   d. Make a display or bulletin board on hospitals of the past, present and the future. Do research to find pictures and materials that describe these different phases of development.
   e. Select a teaching tape such as, "Those Who Serve in White," "Heroes of Health", "Safe and Healthful Vocations" and "Some American Health Heroes," to initiate an investigation activity related to individuals who have been important in the development of health and medical services. After this investigation activity, have different students assume identities of these characters and make costumes or visual aides to aid in their class presentations.
   f. After defining the types of hospitals (public, private, specialty, research, etc.) students could do a survey of the number and types of hospitals in the metro atlanta area on their immediate community. Using the most recent population figures, they could then determine the number of persons served by each hospital, decide if the number of hospitals is adequate for the population and make recommendations for more and different rypes of hospitals if they are needed.

3. Science
   a. Initiate a discussion about the sciences that are important to the field of health services and medicine -- chemistry, biology, anatomy and physiology, physics and nuclear physics, etc. Discuss the scientific training that professional people must have to quality for their positions. This activity would be especially helpful if planned in connection with a resource person's visit.

b. Obtain charts of the human skeletal, organic and muscular systems, study them and locate the most important muscles, organs and bones. Correlate this activity with a teaching tape such as "The Human Machine," and discuss the different health service workers whose work is most closely related to each system. For instance, the physical therapist would need to have a thorough knowledge of the muscular and skeletal systems, the internal medicine physician would have to be thoroughly familiar with the organs and their functions, etc.

c. Research the medical changes that might take place in the future -- include such topics as nuclear medicine, new developments in setting bones and treating burns, new advancements in therapy, etc.

d. Obtain a microscope and materials to make slides. The students could experiment with making their own slides such as small pieces of skin, a drop of blood, different samples of water; or, commercially prepared slides could be used. Relate the activities to similar ones carried on by workers in health service careers.

e. Plan activities and experiments with growing cultures in Petri dishes. Precede the activity with a discussion period related to the causes of common diseases -- germs, viruses, bacteria -- and how they can be combated. Take samples from hands and common objects in the classroom and observe the cultures that grow from them.

f. Do research into the field of X-ray -- how it was developed, how it's used and what are its implications for the future. Try to X-ray slides and either make or obtain a viewer to illuminate the slides for the class to see. This equipment could be used in role playing activities.

g. Obtain simple medical equipment such as a blood pressure cuff and thermometer to record vital signs. Students could take turns checking each other's temperature, pulse rate and blood pressure and recording the information daily on charts. Relate this activity to health service workers activities and discuss how important this information is in relation to their dealings with patients.

4. Mathematics

a. Do exercises with set properties and combinations: Examples might be the set of all hospital workers, the subset of nursing personnel, the subset of therapy workers, etc. Problems dealing with combinations might be done with workers and work situations. For instance, there are ten (10) nurses assigned to the operating room in shifts in teams of two. How many different teams of nurses can be arranged from these ten (10) people arranged in two (2)?

b. Discuss the importance of math skills to workers in the field of health service. Mention some of the specific skills that would apply to these individuals -- accurate time-telling skills, knowledge of formulae and equations, etc.
c. Work word problems dealing with costs of medicines, costs of hospital visits, amounts of medication given to patients, etc. Utilize skills of addition, subtraction, multiplication and division.
d. Practice rounding skills by working problems dealing with amounts and numbers of supplies, numbers of patients, numbers of meals prepared in the kitchen, etc. Do these exercises with a number ray and round to the nearest ten, hundred and thousand.
e. Initiate a discussion of the metric system of measurement used by hospital workers. Name examples of ways that it is used and obtain a conversion chart that shows the equivalents between the metric system and the British-American system. Work conversion problems to reinforce learning.
f. Relate exercises in percentages to the hospital. Use figures such as: If a hospital employs 300 people and 75 of them are nurses, what percentage of the total work force are nurses?

5. Art
   a. Use butcher paper and tempera paint to create a mural depicting hospital activities.
   b. Individuals or groups could make dioramas using cardboard boxes, construction paper, tempera paint and other supplies. Scenes depicted relate to hospital activities.
   c. Talk about the qualities of colors and the feelings and emotional responses that they can create. Discuss how these factors are taken into consideration when choosing colors for an institution like a hospital.

D. CULMINATING ACTIVITIES
1. Take planned field trip to site of interest. Precede the visit with a planned discussion of points of interest, activities to be observed, etc. After the visit, have a de-briefing session to help students verbalize their feelings and reactions.
2. Have final reports from individuals or committees on research projects.
3. Invite other resource persons into the classroom.
4. Reshow films and filmstrips in light of present knowledge.
5. Initiate and complete hands-on activities.
6. Give post-test or questionnaire if one is desired. Talk about the results with the class.

E. FOLLOW-UP ACTIVITIES
1. Repeat one of the original motivation activities -- the discussion of television "hospital" shows -- to see if interest and knowledge has increased.

2. Play the "Knowledge Game" with questions related to hospital personnel and activities. Examples of questions that might be used: What part of the hospital is responsible for identifying slides of tissues to help diagnose disease? The Pathology lab.

F. SUGGESTED HANDS-ON ACTIVITIES

1. Arrange for a trained person to come into the class to teach a basic first-aid course including such things as artificial respiration methods, basic methods of splinting broken bones and fractures, procedures to take for poison or snake bite victims, treatment procedures for simple burns, etc. Members of the class could practice these skills on each other.
2. Incorporate student skits into role playing sessions. Try to make or obtain appropriate equipment to use during the sessions to simulate activities of admitting patient to hospital; making tests and X-rays; charting vital information and medication; prepping for operation; operating on patient; admitting patient to recovery room, etc., try to video tape it.
3. Different members of the class could organize into a health services unit. Roles could be interchanged to allow equal participation by all. Students could learn simple procedures like taking temperatures and pulse rates and could make health charts for members of the class. Appropriate information could be charted daily on individual records.

VI. MATERIALS AND EQUIPMENT

A. Medical Equipment
B. Films, Filmstrips
C. Teaching Tapes
D. Books
E. Pamphlets
F. Posters
G. Personal Interest Inventory
H. Magazines
I. Poster Paper
J. Butcher Paper
K. Tempera Paint
L. Crayons
M. Tape Recorder
N. Construction Paper
O. Microscope
P. Slides
Q. Anatomy Charts
R. Petri Dishes
S. X-Ray Slides
T. Thermometer
U. Watch With Second Hand
V. Metric Charts
W. Cardboard Boxes
X. First Aid Equipment
Y. Color Wheel

VII. EVALUATION

A. Teacher Evaluation
   1. Did I plan effectively, utilizing methods and materials wisely?
   2. Did I cover all six (6) elements of the Career Development approach sometime during the course of the unit.
   3. Did I generate the maximum level of interest and participation through effective motivation activities?

4. Did I maintain a classroom atmosphere conducive to learning?
5. Did I involve the students in the planning to the maximum degree possible?
6. Did I plan activities effectively to include each child to the best of his ability?
7. Did I program activities so as to individualize instruction?
8. Did I use the most effective means of correlating the subject matter?

B. Observations of the Child
1. Observe the flexibility of individual role interaction within the group.
2. Observe the child's use of communication skills both as an individual and as a part of the group.
3. Observe for evidence of individual research and task completion.
4. Look for evidence of social interaction skills -- does the child share materials, take turns, accept responsibility willingly and communicate well with his peers?
5. Observe for any evidence of change in attitude toward school-related activities. Look for any changes in attitude toward the world of work.

C. EVALUATION (Post-Test on Subject Matter)
1. Learners will spell a group of words read aloud by the teacher. Also they will use them correctly in sentences to demonstrate their meaning.
2. Learners will work math problems on percentages with figures related to hospital services and workers.
3. Learners will name as many medical services workers centered in the hospital as possible and describe their duties, responsibilities and job characteristics according to the six (6) classifications of information in the Occupational Outlook Handbook.
4. Learners will use role playing methods to demonstrate first aid techniques such as treating snake bites, stopping bleeding and giving artificial respiration.

VIII. NOTES TO THE TEACHER

This unit format has been developed as the most convenient method of organizing the materials and activities in order, beginning with objectives and concepts, including motivation and study activities and concluding evaluation and source material lists. A wide range of materials, facts, ideas, and activities is presented to allow each individual the opportunity to structure his unit to fit the needs of a particular class. Selecting and combining activities, adjusting the scope of the unit, supplementing materials to meet the needs of his class --all these are teacher strategies that may be used with this unit format. The six (6) elements of the Career Development approach are included in this guide,

but it is the individual teacher's ordering of them that makes his class's unit unique.

IX. TEACHER AIDS

A. Films
1. "Health in Our Community"

GEORGIA CATALOG OF CLASSROOM TEACHING FILMS, # 9, 1968-71.

B. Teaching Tapes
1. "Socialized Medicine"
2. "Those Who Serve in White"
3. "Heroes of Health"
4. "Safe and Healthful Vocations"
5. "Some American Health Heroes"
6. "The Human Machine"

GEORGIA CATALOG OF CLASSROOM TEACHING TAPES, # 5, 1969-72.

X. BIBLIOGRAPHY

A. Teacher Resources
1. Garland, Joseph, The Story of Medicine, Boston: Houghton Mifflin Company, 1949
2. Knowles, John, Hospitals, Doctors and the Public Interest.
3. Roth, Claire J. and Lillian Weiner, Hospital Health Services, New York, Henry Z. Walck, Incorporated, 1964.

B. Student Resources
1. Barr, Young Scientist and the Doctor, New York: McGraw Hill 1969.
2. Darby, Your Career in Physical Therapy, Julian Messner, 1969.
3. Elting, The First Book of Nurses, New York: Franklin Watts, 1951.
4. Froman, Let's Find Out About the Clinic, New York: Franklin Watts, 1968.
5. Greene, Doctors and Nurses, What Do They Do? Harper, 1963.
6. Hyde, Medicine in Action: Today and Tomorrow, New York: McGraw Hill, 1964.
7. Rowland, Let's Go To a Hospital, G. P. Putnam's Sons.
8. Thompson, About Miss Sue, The Nurse, Children's Press, 1961.
9. Wright, Great Adventures in Nursing, Harper and Rowe, 1960.

C. Additional Sources
1. D. O. T.
2. Occupational Outlook Handbook
3. SRA Occupational Briefs

D. Suggested Field Trip Sites

1. Cobb General Hospital
   3950 Austell Road
   Marietta, Georgia

2. Kennestone Hospital
   737 Church Street
   Marietta, Georgia

3. Emory University Hospital and Clinic
   1364 Clifton Road, N.E.
   Atlanta, Georgia

4. Grady Hospital
   80 Butler Street, S. E.
   Atlanta, Georgia

TELEVISION

Careers in Communications and Media

Grades 5 & 6

Teachers Resource Guide

INTRODUCTION TO THE TELEVISION UNIT

Through their participation in unit activities related to the television industry, elementary students gain a new perspective of television as a medium of communication entertainment, education and information. Youngsters' awareness of themselves; their community; the people and processes involved in television production, and the way subject matter skills and concepts are applied is heightened by unit activities.

In the unit guide, teachers are provided sufficient background information on the processes of television transmission and reception to enable them to help students learn the very basic principles. High student interest in the unit topic gives the teacher an effective motivational tool to involve students in exciting and meaningful learning experiences. Grade level subjects in all areas are easily correlated to the unit study.

I. GOALS, OBJECTIVES AND CONCEPTS

A. TEACHER GOALS

1. To broaden the student's knowledge of himself and the work community.
2. To provide the student insight into the structure and functions of the television industry.
3. To stimulate the student's awareness of community work roles related to the television industry.
4. To broaden the base of the student's experiences by incorporating content and skills into activity-centered learning situations.
5. To provide the student varied experiences to help him evaluate his abilities and interests, and to determine personal values.
6. To help clarify the student's understanding of his role as an individual contributor to the cooperative effort.
7. To help the student learn to work well both on his own initiative and as a member of the group.
8. To provide the student additional opportunities to develop decision-making skills by involving him in the decision-making process.
9. To encourage the student to think for himself.
10. To stimulate the student's realization that all areas of work are dignified deserve respect and contribute to a functioning society.

B. LEARNER (BEHAVIORAL) OBJECTIVES

NOTE: These objectives may have to be adapted to fit the special abilities of individuals within a class.

1. By the end of the unit study, the learner will be able to recognize, spell and define briefly a minimum of 75% of the vocabulary terms introduced. Also, he will be able to use them correctly in the context of written work and oral activities.
2. The learner will be able to name a minimum of ten (10) work roles directly associated with the television industry.
3. The learner will be able to describe some of the job duties and characteristics of those ten (10) work roles with 75% accuracy in the descriptions.
4. The learner will be able to make a simple graphic representation of the process of making an image, transmitting it and receiving it in a television set. (See Subject Matter)
5. The learner will be able to identify at lease four (4) major items of equipment used in a television station. (Microphone, camera, boom, jack, signal amplifier, transmitter, etc.
6. The leaner will be able to describe the functions of each of the four (4) pieces of equipment identified.
7. The learner will be able to name the major parts of a television receiver.

8. The learner will be able to solve math computation problems related to commercial time and advertising costs. The minimum standard of performance will be 75% accuracy in the results.
9. The learner will be able to describe the application of language arts skills in the television industry, mentioning at least three (3) specific examples in the description.
10. The learner will be able to name at least four (4) different types of television productions. (News, mysteries, sports, comedies, public affairs, dramas, "specials").

C. CONCEPTS*

1. Throughout history, many different forms of communication have been used by human beings. (Oral, language, pictures, symbols, writing, printing, etc.)
2. Contemporary science and technology have made vast and far-reaching changes in methods of communicating.
3. Television is one (1) medium of communication that has been developed through scientific experiments and improvements.
4. Many scientists and inventors contributed their time and efforts to the long process of developing television.
5. The literal definition of the word, television, is "vision at a distance."
6. Television is a means of sending pictures and sound through the air from one place to another.
7. Electricity is necessary for television and reception.
8. Television signals are sent as waves -- two (2) kinds of waves, actually. One carries the sound and the other the picture.
9. Invisible to the eye, these waves are made by electricity which causes them to travel at high speed (186,000 m.p.s.) through the air.
10. The structure of the human eye is very important to our seeing the pictures on a television screen.
11. At the back of the human eye is the retina, which contains tiny cells (rods and cones) that help us see color.
12. This screen (retina) reflects a picture made up of numerous tiny dots, but these dots blend into a smooth picture. Television pictures are made up of literally thousands of dots that blend into a total picture.
13. Television receivers contain small glass and metal units called vacuum tubes. Inside each tube is a metal plate and a cathode rod. Electricity heats the cathodes, causing them to throw off tiny bits of electricity. (electrons)
14. Collected on a plate, these electrons are responsible for putting the picture on the screen and reproducing the sounds through the loud-speaker.
15. Of all the tubes in the television receiver, the largest is the picture tube -- one end of which is the screen, where the picture appears.
16. The screen is flourescent which means that it has a special chemical coating that causes it to glow with light when electrons hit it.
17. When electrons hit the screen, they cause tiny dots to glow and move, and this movement causes the constantly moving picture. Some of these dots are dark and others light.

*Corbett, WHAT MAKES TV WORK?

18. To create these dot-pictures, a television camera is needed. Each picture goes into the camera through the lens and passes to the image orthicon (camera) tube.
19. Smaller than a television picture tube, the image orthicon tube has a small screen (photoscreen) that gives off light when electrons hit it. The greater the amount of light that hits the screen at any one point, the more electrons are thrown off at that point.
20. Immediately behind the photoscreen is a second screen with fine wire mesh in front of it. Known as the target, the second screen collects the electrons from the photoscreen in a particular pattern
21. An electron gun at the rear of the camera tube also shoots a stream of electrons at the rear side of the target -- a process known as scanning, which is done 525 times for every different picture.
22. This scanning stream searches for the electrons which have hit the target and each point gives off a "message" containing different numbers of electrons.
23. When the scanning stream with its series of "messages" bounces off the target, it is directed to a collecting plate. Now, the stream of electron messages is like a strong of beads of different sizes and is known as a signal.
24. From the collecting plate, the signal passes through numerous vacuum tubes in the camera which strengthen the signal significantly.
25. Next, the signal is transmitted to a control panel in the television studio control room. Each camera involved in the filming sends its signal to the control room where it appears as a picture on a monitor.
26. The signal for that picture is transferred through another wire to the transmitter which sends out the signals on carrier waves. These waves travel at different speeds or frequencies and may be known either as VHF (Very High Frequency) waves or UHF (Ultra High Frequency) waves. These waves travel in generally straight lines and cannot bend around or go through mountains or high buildings.
27. One (1) modern method of transmitting carrier waves over long distances involves the use of a satellite to beam and direct the waves in a particular direction.
28. Traveling easily through the air, the waves are picked up by the antenna of a television receiver and transmitted to that receiver. Once in the receiver, the signal is strengthened by the vacuum tubes which send it on to the picture tube.
29. Arranged something like the television camera tube, the picture contains an electron gun that changes the signal back into a stream of electrons This stream is shot at the large fluorescent screen.
30. This stream of electrons scans the screen, reproduces the glowing dots and makes the picture appear.
31. The relationship of light and dark on the television screen is always the same as on the camera photoscreen.
32. How is color television transmitted? Inside the black and white television camera, there is one image orthicon tube where the color camera has three (3).
33. When light enters the color camera, it passes through different color glass filters (red, blue, green) which break the light down into the primary colors.

34. Each image orthicon (camera) tube receives the electrons from one of the colors and each makes a signal out of these in the same way as in the black and white camera tube.
35. Three (3) signals are sent on the carrier waves, rather than one (1). And in the color television receiver, there are three (3) electron guns rather than the one (1) found in the black and white receiver.
36. Each electron gun receives the signal from one of the colors and shoots it into an aperture (shadow) plate which is between the gun and the screen.
37. This aperture plate contains thousands of tiny holes which correspond with groups of colored dots on the screen behind it. Passing through the holes in the plate, the signals hit the screen and cause the groups of colored dots to glow. The colors of the dots blend in to make a total, smooth picture.
38. As a medium of communication, education and entertainment, television has had a tremendous impact on our modern society.
39. The television industry is a large one in terms of numbers of people, and amounts of time and money involved.
40. Television is such an important medium of communication and affects so many people that an agency of the Federal Communications Commission, regulates the broadcasting activities of the networks.
41. The three (3) largest broadcasting networks, CBS, ABC, NBC, use revenue from commercial time and other sources to finance their broadcasting activities.
42. These networks, along with public and educational broadcasting units, present a variety of programs to interest, inform and entertain viewers. Some of the different types of programs presented include: movies, sports, productions, comedies, news programs, "specials," dramas, public affairs and many others.
43. School subject matter concepts in the areas of language arts, mathematics, social studies, science, music and art have important applications in the television field.

II. SUBJECT MATTER

A. DEFINITION OF TERMS

1. Amplifier: Any device for making signals stronger. Usually it acts like a valve, where a weak signal opens or closes the valve to control the flow of a stronger current.
2. FCC: Federal Communications Commission; a government board which regulates radio and television broadcasting.
3. Receiver: A device, such as a part of a radio, television set or telephone that receives incoming electromagnetic signals and converts them to perceptible forms.
4. Television: a. The transmission of visual images of moving and stationary objects, generally with accompanying sound, as electromagnetic waves and the reconversion of received waves into visual images. b. An electronic apparatus that receives such waves and displays the reconverted images on a screen.

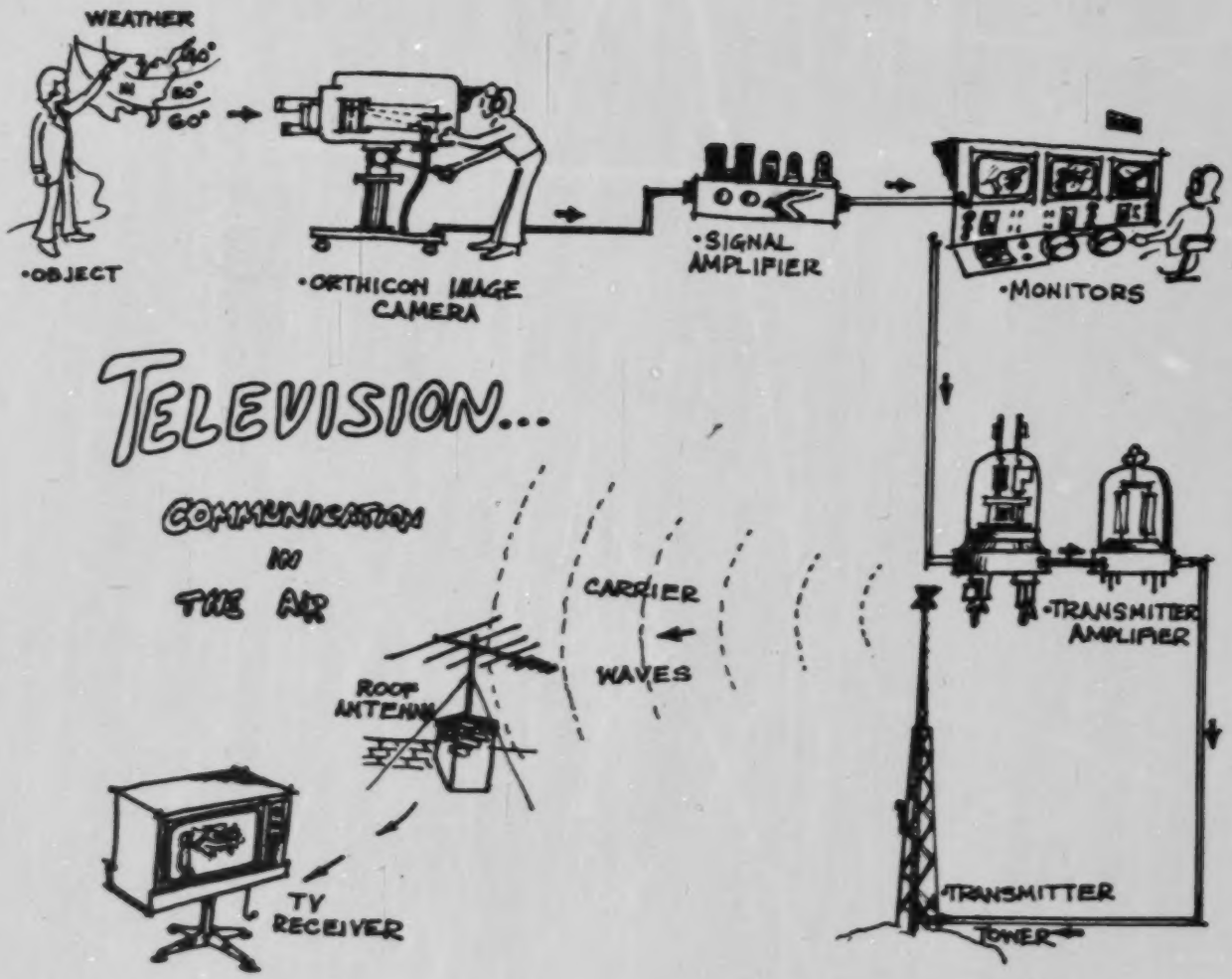
5. Transmitter: Electronic equipment that generates and amplifies a carrier wave, modulates it with a meaningful signal . . . and radiates the resulting signal from an antenna.

B. SUGGESTED VOCABULARY TERMS

1. Aerial
2. Amplifier
3. Antenna
4. Boom
5. Broadcast
6. Cathode Rod
7. Carrier Waves
8. Channel
9. Collecting Plate
10. Color
11. Commercial
12. Electricity
13. Electron
14. Electron Gun
15. FCC
16. Frequency
17. Iconoscope
18. Image Orthicon
19. Media
20. Microphone
21. Mike
22. Monitor
23. Network
24. News
25. Photoscreen
26. Picture
27. Picture Tube
28. Production
29. Projector
30. Receiver
31. Satellite
32. Scanning
33. Signal
34. Shadow Plate
35. Signal
36. Sound
37. Sponsor
38. Studio
39. Synchronize
40. Target
41. Television
42. Transmitter
43. Tube
44. UHF
45. VHF
46. Vacuum Tube
47. Video Tape Recorder
48. Waves

C. ILLUSTRATED PRINCIPLES OF TELEVISION (SEE NEXT PAGE)

*Denman, TELEVISION -- THE MAGIC WINDOW
*AMERICAN HERITAGE DICTIONARY


WEATHER
•OBJECT
•ORTHICON IMAGE CAMERA
•SIGNAL AMPLIFIER
•MONITORS
TELEVISION...
COMMUNICATION IN THE AIR
CARRIER WAVES
ROOF ANTENNA
TV RECEIVER
•TRANSMITTER AMPLIFIER
•TRANSMITTER
TOWER

III. OCCUPATIONAL INFORMATION

A. GENERAL DESCRIPTION*

As part of the field of communications and media, the television industry presents an extremely wide range of career opportunities to interested individuals. A variety of professional and technical positions may be identified in this area with most jobs being broadly classified as either "above the line" or "below the line" positions.

These jobs classified as "above the line" are generally the more glamorous ones directly associated with broadcasting: performers, actors, producers, directors, writers, etc. "Below the line" operations involve those backstage, backbone positions such as assistant directors, floor managers, camera operators, engineers, and technicians. These jobs are the ones that keep production activities planned, coordinated and moving on schedule by making plans, supplying needed materials and equipment, outlining schedules and other necessary tasks.

The diversity of activities in the television industry indicates that there will be a diversity of occupational opportunities with varying educational, skill and personal qualifications.

B. JOB ENTRY AND PREPARATION

Gaining entry into one of the many careers in the television industry would involve a knowledge of the educational, skill and personal qualifications associated with the particular job. Some jobs require college training, others technical school preparation and still others apprenticeship and on-the-job experience.

More and more of the professional jobs in broadcasting are requiring college preparation to meet the complex demands of the work. A liberal arts degree is usually acceptable but a degree in broadcasting is more desirable for the "above the line" positions. "Below the line" jobs usually require a sound technical knowledge of procedures and equipment gained through technical school training.

Those interested in obtaining more information about job requirements should consult guidance counselors, local broadcasting stations, college catalogs, and other occupational information sources.

C. GENERAL REQUIREMENTS

Among the requirements for positions in the television field are: a cooperative and responsible attitude, interest in the word, a sound general education with emphasis on language arts and English, effective interpersonal skills and the willingness to keep informed of developments and events in the field.

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*Gordon and Falk, YOUR CAREER IN TV AND RADIO

D. WORKING CONDITIONS AND BENEFITS

"Above the line" jobs in television broadcasting carry with them the assets of glamour and generally high salaries but also the hazards of uncertain unemployment, the confusion of irregular hours and often extensive travel and a great deal of pressure. On the other side, "below the line" jobs usually do not involve high salaries of glamour, but the work is secure, hours are more regular and the pressure to perform perhaps not so great.

Many of the workers in the television industry, especially those technicains and craftsmen, belong to unions. Many of the positions in the field can be held by either men or women with talent, training and ability being the deciding factors in determining the sex of the worker.

E. OCCUPATIONAL LISTINGS (DEPARTMENTS)

1. Advertising and Commercial Sales
   - a. Commercial time manager
   - b. Commercial time salesman
   - c. Graphic artist
   - d. Account executive
   - e. Copy writer
   - f. Research specialist
   - g. Sales development manager
   - h. Production clerk

2. Production
   - a. Producer
   - b. Playwright
   - c. Director
   - d. Script writer
   - e. Script editor
   - f. Dramatist
   - g. Researcher
   - h. News writer
   - i. News director
   - j. News analyst
   - k. Newscaster
   - l. Reporter
   - m. Documentary writer
   - n. Copy writer
   - o. Casting director
   - p. Sports writer
   - q. Sportscaster
   - r. Foreign Correspondent
   - s. Actor
   - t. Actress
   - u. Entertainer
   - v. Performer
   - w. Costume designer
   - x. Costumer
   - y. Makeup artist
   - z. Scenery designer
   - aa. Choreographer
   - bb. Announcer
   - cc. Production assistant

3. Business and Clerical
   - a. Station manager
   - b. Receptionist
   - c. Secretary
   - d. Public relations manager
   - e. Tour guide
   - f. Accountant
   - g. Clerk
   - h. Typist
   - i. Stenographer
   - j. Administrative Assistant

k. Business manager
l. Messenger
m. Office boy

4. Technical
   a. Floor director
   b. Director
   c. Assistant director
   d. Program assistant
   e. Studio Supervisor
   f. Cameraman
   g. Studio control engineer
   h. Audio engineer
   i. Video engineer
   j. Chief engineer
   k. Technical director
   l. Special effects engineer
   m. Orchestrator
   n. Schedule manager

IV. SUGGESTED MOTIVATION ACTIVITIES

A. Introduce the term, communication, and lead the class members in defining it in their own terms. Help students enumerate as many examples as possible of different forms of communication, mentioning television as one (1) medium of communication.

B. Ask questions to stimulate students to compare and contrast television with other means of communication such as books, newspapers, radio, etc.

*C. Involve the students in watching a television show in class or encourage them to watch television at home. Before viewing, ask for the class' ideas about how the show originated and list some "things to find out."

1. How does the picture get to our television sets?
2. Who decides what shows to put on and when they will be seen?
3. Why do we have commercials?
4. Who are some of the people involved at a television station and what are their jobs?
5. What are the "credits" at the end of a program?

D. Lead the class in discussing what they discovered from watching the television program (s).

E. Select and show an appropriate film, film loop or filmstrip to stimulate student interest. Selections such as "The Story of Communication" or "Inventions that Helped Communication" might be effective audio/visual aids. Discuss the films afterward.

F. Use colorful illustrated materials to design a bulletin board display on some aspect of television. Call the students' attention to the display and use it as a visual aid in stimulating future discussions.

G. Prepare and give an Interest Inventory to assess students' present viewing interests and knowledge of television as a medium of communication. Keep records of the results.

H. Gather library books, paperbacks, teaching tapes, posters, magazines and other materials to make an Interest Center in one (1) area of the room. Encourage students to use the materials and share findings with the rest of the class.

V. SUGGESTED STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Begin motivation activities and use throughout the unit to stimulate and maintain student interest.
2. Lead the group in discussing the question, "What's Important to Know About the Television Industry;" Have a student take notes during the discussion. Or, give the class an Exceptations sheet on the question, "What Do You Expect to Learn from the Television Unit?"
3. Plan the unit activities, involving the youngsters as much as possible in identifying sources of materials and supplies, resource persons and possible field trip sites. Allow the class to divide into several small interest groups to assist in planning activities and rotate group assignments often to provide a variety of experiences for students.
4. Guide the students in identifying areas of interest for group and individual projects. Allow the class to select a group and individual interest area to research.
5. Start work on a class scrapbook or file folder of related newspaper and magazine clippings of interest to the students. Or, reserve a section of the bulletin board for "Current Events in Television," and have students look for related articles and pictures.
6. Work with the class in developing an Interview Form with appropriate questions for resource persons and field trips. Also, develop a research project reporting form for group and individual work.

B. RESEARCH ACTIVITIES

1. Initiate group and individual research projects on topics such as: Inventions that led to television; Names in the field of communication; Who is Marshall McLuhan and what is he saying; Research studies in television, and other areas of interest.
2. Use resource materials to investigate the principles of television transmission. A film loop such as "Principles of Television," or a teaching tape such as "Electronics in Communication" might be effective audio/visual aids in the research.
3. Identify the different career areas in the television industry and begin research to determine the work role characteristics, job duties and educational/skill preparations necessary for particular careers.
4. Begin work on charts of career listings and descriptions for the classroom walls. Or, a folder or booklet with lists of careers illustrated with art work or picture cutouts could be made.
5. Involve the students in making a "People/Products Pyramid" in which the stages of development of television production are outlined in pyramid (sequential) form. Help the students develop a sequential list of occupations related to producing a television show. Make a colorful,

illustrated chart or mobile of the finished product for classroom display.

6. *Plan a class research project to investigate the Federal Government's* role in regulating broadcasting activities. Study the early legislative acts that led to the creation of the Federal Communications Commission, (Communications Act of 1934) and identify some of the licensing requirements for television stations.
7. Continue research into the principles of television transmission by identifying and describing the function of some of the major items of equipment used in a television studio to produce and transmit the picture. Illustrated wall charts could be made in connection with this activity and would help to reinforce students' learning.

C. CORRELATING ACTIVITIES

1. LANGUAGE ARTS

a. Lead the class in identifying and studying new vocabulary terms from the unit. Small groups of students could make folders or wall charts of listings and definitions and the words could be used in spelling games and written assignments.

b. Encourage students to select books and magazine articles to read in connection with the unit topic. Reading reports (oral or written) could be made from such readings.

c. Guide the class in a discussion of applications of language arts skills in the television industry. Get examples from the students of different ways that language arts skills are used and use role playing techniques to illustrate the uses.

d. Devise role playing activities such as a comedy writer's preparing a script for a show; a broadcaster's reading the news; and advertising assistant's editing copy for a commercial; an actor's rehearsing lines for a play, etc. Discuss the activities afterward with the students to insure that they understand the purpose.

e. Involve different individuals and student groups in writing a script or choosing a play for adaptation for a class production. Have different committees select plays or books to submit for class approval.

f. Provide students opportunities to utilize their critical reading, note-taking, summarizing, writing and reporting abilities in doing research on careers in television and other related topics of interest.

g. Plan a class production that will involve all students and utilize all language arts skills. (See Hands-On Activities).

2. MATHEMATICS

a. Talk with the students about the applications of classroom mathematics skills to the television industry. Mention such examples as the use of time-telling abilities in figuring split-second times for productions; the use of computation skills in tallying costs for commercial time sales, and in budgeting time, personnel money and materials for productions, etc.

b. Invite a resource person (accountant, commercial time salesman, account executive) to visit the students to describe the use of math

skills in his work and to relate his feelings about the job.

c. Demonstrate how the math skills of multiplication and division are used by workers such as commercial time salesmen in preparing tables of cost figures for use in quoting prices to prospective customers. Prepare such a table for the class, using figures gained from researching local commercial time costs. In connection with this activity, talk about how the length of the commercial and the time it is shown affects the costs.

d. Give students opportunities to practice their computation skills by providing them problems of varying difficulty. Relate the problems to time, commercial costs, production budgets, salaries and materials for television productions, etc.

e. Utilize geometric concepts and measurement skills in the students' laying out materials to build sets, props and to make costumes for the class television production.

f. Relate the study of fractions, decimals and percentage to the viewing survey aspect of the television industry. Talk about how workers in this field select a sample, record the viewing habits, and then interpret the resulting data in fractional, decimal and percentage form.

g. Simulate the above activity in the classroom to give students practice in working with fractions, decimals and percentages.

3. SOCIAL STUDIES

a. Introduce terminology related to communication, define the terms and talk about television as a medium of communication. Discuss television's role as an "instant" communicator and the effects this "instant" communication has on participants in that medium. Compare and contrast this medium of communication with others such as speaking and printing.

b. Plan a research project on the history of the development of television. Design a bulletin board to illustrate some of the inventions that led to the development of television. Talk about the structure of our modern broadcasting system -- the major networks, the public and educational systems, etc.

c. Investigate the topic of ethics in broadcasting -- in the areas of programming, journalism, advertising and others. Use such questions as, "What is meant by ethics in broadcasting? Does television have a responsibility to its viewers to provide fair, unbiased representation of news and events? Should commercial advertisers be required to regulate their commercial messages according to standards of accuracy and fairness?" to stimulate the discussion.

d. Design a bulletim board to depict the various functions of the television industry -- entertainment, education and information, and examples of the wide variety of programs presented by the networks.

e. Do research to gather information for a debate on the pros and cons of television programming for children of primary age. Talk about the possible effects of violence in programming, the inane content of certain shows such as cartoons, the lack of educational programming, etc.

f. Have class members debate the pros and cons identified in the previous research activities.

g. Plan an investigation activity to determine the Federal government's role in regulating television programming. Talk about the legislation that led to the formation of the Federal Communications Commission, and the activities of the Commission to supervise broadcasting activities.

4. SCIENCE

a. Initiate the study of the basic principles of television transmission through an investigation of some of the underlying concepts of energy, magnetism, electricity, theories of light and sound waves, and the human senses involved in perceiving a television broadcast. (See Cobb County Curriculum Guides).

b. Define the basic terminology associated with the above concepts and help students become familiar with them.

*c. Plan a discussion activity to investigate the relation between electricity and magnetism. Do an experiment using a magnetic compass, dry cell and insulated wire to demonstrate the relation. Bare the ends of the insulated wire, fasten one end to the center post of the dry cell, making a single loop of the wire. Lay the free end near the outside post of the dry cell, but do not connect it. Place the compass near the wire and observe the compass needle; then, connect the wire to the binding post, watching the compass needle as the connection is made. (an electrical current passing through a wire produces a magnetic field around the wire.) Similar experiments might be helpful in reinforcing understanding.

d. Discuss ways that electrical energy is utilized in transmitting and receiving television waves. See Unit concepts for background information on the uses of electricity.

e. Introduce the concepts of light waves and invisible radiant energy waves, define them and relate to the study of television transmission. Talk about the characteristics of these waves -- they are a type of radiant energy; traveling at the speed of 186,000 miles per second in a straight line through the air; they can pass through certain non-metallic objects but cannot pass through metal or earth, etc. A film such as "Light Waves and Their Uses" might be helpful here.

*f. Do some simple experiments to illustrate the way that light waves travel. An activity involving a light bulb and socket, knife, cardboard box and small pieces of cardboard could illustrate this principle.

g. Correlate the study of sound transmission with the investigation of light and radiant energy waves.

h. Make a study of the human senses (hearing and vision) involved in the perception of a television broadcast. Draw illustrated charts of the structures involved or make models of the eye and ear to use as visual aids in the study.

5. ART

a. Use a variety of different materials and art supplies in designing and making scenery, props and custumes for the class "television" production.

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* Sund, Tillery, Trowbridge; THE PHYSICAL SCIENCES

b. Plan a discussion of the applications of art in the television industry. Guide the students in identifying some of the ways art is used in the field and some of the other people who use it. (Set designers, scenery, builders, make-up artists, graphic artists, costume designers, etc.) A resource person might be helpful in this activity.
c. Design a colorful mural depicting as simply as possible the principles of television transmission. (See Subject Matter) Have different individuals or groups work on different sections.
d. Have students collect magazine and newspaper pictures of favorite television personalities and programs. Make collages of the collected pictures.
e. Make attractive posters to advertise the class "Television" production. Use poster board, construction papers, art paper and other materials.
f. Have students make dioramas, models or shadow box displays to depict the layout of a television studio, the sets for a production or other scenes of interest to them.
g. Use materials such as cardboard or papier mache in making models of the human eye or ear to use in science activities. Paint the finished models.

6. MUSIC
   a. Select appropriate recorded music to use as background music for the class production. Discuss with the students the importance of selecting music to fit the mood of the program.
   b. Relate the above activity to similar ones carried out by the music director for a television show.

D. SUGGESTED HANDS-ON ACTIVITIES

1. Guide the class in planning a "television" production. Involve all students in setting up small committees (groups of 2-5 persons) to identify roles in the production process, choose a program, identify materials and equipment needs, make props and scenery, assign roles, coordinate tapes, etc.
   a. Have script committee work to select a program such as a short play, talent or variety show, public affairs broadcast or news program. If the committee cannot find an appropriate selection, they might want to write their own script.
   b. Encourage students to choose roles of interest to them in the television production process. Some might wish to be set designers and builders and make the props; others might want to be costumers and make the costumes needed; some might want to be the entertainers and learn the lines; while other individuals might like to be directors or producers and coordinate the total effort.
   c. Items that might be made by students include: advertising posters, props, scenery, costumes, cue cards, "cameras" from cardboard boxes, and microphones and sound equipment.
   d. In connection with this activity, students might want to write and produce their own commercials about real or imaginary products or upcoming school and community events.

e. Coordinate the total production effort, rehearse the show and have the final effort taped on video tape. Conclude the total hands-on activity with a summary discussion of the students' reactions to their individual roles, their likes and dislikes and their feelings about their participation and contribution to the group project.

2. Have class members make dioramas, shadow boxes or models of typical television studio, television transmitter or receiver. Label the most important items in the display and discuss their functions.
3. Involve youngsters in planning a survey of classroom or school television viewing habits. Have the class members develop and administer a questionaire to identify viewing habits, reporting the data in fractional, decimal and percentage form.

E. SUGGESTED CULMINATING ACTIVITIES

1. Set up a field trip to a local television studio to see a show being televised. Prepare the youngsters before the visit, using the YELLOW PAGES OF LEARNING RESOURCES as a guide in outlining questions to be answered.
2. Have final oral or written reports on research activities from groups or individuals. Try to tape the reports for future reference.
3. Invite parents, friends, the principal, and other teachers and classes to view the video tape of the class production.
4. Give an Interest Inventory or Expections Sheet and compare the results with those from earlier activities.
5. Display models or projects in a central area of the school, posting charts with information about the unit.
6. Lead the class in a summary evaluation discussion of the total unit. Help the youngsters assess their involvement in the unit activities; their reactions to their roles; their feelings about their participation in correlating subject matter activities, etc.
7. Invite another resource person to visit the classroom to share experiences ideas and feelings with the students.

F. SUGGESTED FOLLOW-UP ACTIVITIES

1. Continue to use vocabulary words and terms from the unit in spelling games and drills afterward to help reinforce learning.
2. Keep up the Current Events Corner, including articles on the television industry to keep students informed on new developments.
3. Play the "Knowledge Game," using questions related to the unit topic.

VI. MATERIALS AND EQUIPMENT NEEDS

A. Poster Paper
B. Construction Paper
C. Art Paper
D. Magazines and Newspapers
E. Cardboard Boxes
F. Butcher Paper
G. Student Interest Inventory
H. Expectations Sheets
I. Library Books and Dictionaries
J. Occupational Information Materials
K. Films and Filmstrips
L. Film Projector
M. Teaching Tapes
N. Tape Recorder
O. Scissors
P. Shellac

Q. Paint Brushes
R. Magic Markers
S. Masking Tape
T. Stencils
U. Tempera Paint
V. Camera and Film
W. Crayons and Chalk
X. Shoe Boxes
Y. Aluminum Foil
Z. Tin Cans
AA. Glue
BB. Records and Record Player
CC. Magnetic Compass
DD. Dry Cell
EE. Copper Wire
FF. Light Bulb
GG. Socket

VII. EVALUATION

A. SELF-EVALUATION

1. Did I attain all the goals I had set for myself as a teacher?
2. Did I plan effectively, utilizing methods and materials wisely?
3. Did I involve the youngsters to the maximum extent possible in planning and coordinating unit activities?
4. Did I incorporate all six (6) elements of the Career Development approach into the unit study.
5. Did I generate the maximum level of interest and participation through effective and reinforcing motivational activities?
6. Did I maintain a classroom atmosphere conducive to learning?
7. Did I plan adequately to include each child to the best of his ability?
8. Did I program activities so as to individualize instruction as much as possible?
9. Did I use the most effective means of correlating the subject matter?
10. Did I facilitate both individual initiative and group cooperation?

B. OBSERVATION OF CHILD

1. Observe the flexibility of individual role interaction within the group.
2. Observe for evidence of individual research and task completion.
3. Observe for evidences of strengthening of individual self-images.
4. Observe the youngster's ability to apply his abstract knowledges to concrete learning situations.
5. Observe the student's use of communication skills both as an individual and as a member of the group.
6. Look for evidence of social interaction skills -- does the child accept responsibility willingly, complete tasks, share materials, take turns and communicate well with his peers?
7. Observe for any evidence of change in attitude toward school-related activities and the work community.

C. WRITTEN EVALUATION (PRE-AND-POST TEST IF DESIRED)

Place an X in the blank(s) the best complete the statement

1. A.____ "Vision at a distance."
   B.____ The transmission of pictures and sound through waves.
   C.____ An electronic set that shows such pictures and reproduces the the sound.
   D.____ All of the above.

2. Name as many work roles as you can that are related to the television industry.
3. True or False. Respond to the following statements by placing a T in the blank if the statement is TRUE; and an F if it is FALSE.
   A.____ Workers in the television industry never use math, science or language arts skills in their jobs.
   B.____ Microphones, cameras, cables and booms are some of the pieces of equipment used in a television studio.
   C.____ All workers in the television industry must have a college degree to do their jobs.
   D.____ Either men or women can work in most all the jobs found in the television industry.

VIII. RESOURCE MATERIALS

A. FILMS
   1. "Communication in the Modern World"
   2. "Communication for Beginners"
   3. "Development of Communication -- From Telegraph to TV"
   4. "Light Waves and Their Uses"
   5. "Television: How it Works"
   6. "The Communications Explosion"

   GEORGIA CATALOG OF CLASSROOM TEACHING FILMS, 1972-75.

B. FILMSTRIPS
   1. "Careers in Television"

   CHARLES CLARK AUDIO-VISUALS -- Farmingdale, New York

   2. "Communication Knits Our World Together"
   3. "Creating a TV Program"
   4. "Inventions That Helped Communication"
   5. "Our Senses -- Hearing"
   6. "Our Senses -- Seeing"

   EYE GATE HOUSE -- Jamaica, New York

C. FILM LOOPS
   1. "Principles of Television"

   CHARLES CLARK AUDIO-VISUALS -- Farmingdale, New York

D. TEACHING TAPES
   1. "Is There a Method to Help You in Choosing a Career?"
   2. "Television"

   GEORGIA CATALOG OF CLASSROOM TEACHING TAPES, 1968-72.

IX. BIBLIOGRAPHY

A. CHILDRENS' SELECTIONS

1. Alder, Irving; COMMUNICATION. Day Publishing, 1967.
2. Beck; HOW TO HAVE A SHOW. Franklin Watts, 1957
3. Chapin, Cynthia; NEWS TRAVELS: LOCAL COMMUNICATION. Whitman, 1967.
4. Clarke; YOU AND ELECTRONICS. Childrens' Press, 1967.
5. Colby, C.B.; COMMUNICATIONS: HOW MAN TALKS TO MAN ACROSS LAND, SEA AND SPACE. Coward - McCann, 1964.
6. Corbett, Scott; WHAT MAKES TV WORK?. Boston: Little, Brown and Company, 1965.
7. David, Eugene; TELEVISION AND HOW IT WORKS. Prentice - Hall, 1962.
8. Denman, Frank; TELEVISION THE MAGIC WINDOW. New York: MacMillan, 1952.
9. Gordon and Falk; YOUR CAREER IN TV AND RADIO. New York: Julian Messner, 1966.
10. Herron, E. A.; MIRACLE OF THE AIR WAVES: A HISTORY OF RADIO. New York: Julian Messner, 1969.
11. Jones; MAKE YOUR NAME IN MODELING AND TELEVISION. Harper, 1960.
12. Lukashok, Alvin; COMMUNICATION SATELLITES: HOW THEY WORK. Putnam, 1967.

B. TEACHER'S SELECTIONS

1. Cox, Louis; INVESTIGATING SCIENCE WITH CHILDREN -- ENERGY AND WAVES. Darien: Teachers Publishing Corporation, 1968.
2. Fabre, Maurice; A HISTORY OF COMMUNICATIONS. New York: Hawthorne Books, 1963.
3. Kerman, Stephen; COLOR TELEVISION AND HOW IT WORKS. New York: Sterling Publishing, 1968.
4. Solotaire, Robert; HOW TO GET INTO TELEVISION. New York: Sheridan House, 1957.
5. Sund, Tillery and Trowbridge; ELEMENTARY SCIENCE DISCOVERY LESSONS -- THE PHYSICAL SCIENCES. Boston: Allyn and Bacon, 1970.

C. ADDITIONAL SOURCES OF INFORMATION AND MATERIALS

1. DICTIONARY OF OCCUPATIONAL TITLES
   U.S. Government Printing Office
   Washington, D.C. 20402
2. OCCUPATIONAL OUTLOOK HANDBOOK
   U.S. Department of Labor
   U.S. Government Printing Office
   Washington, D.C. 20402
3. SRA OCCUPATIONAL BRIEFS
   Science Research Associates
   259 East Erie Street
   Chicago, Illinois 60611
4. YELLOW PAGES OF LEARNING RESOURCES
   M. I. T. Press
   Cambridge, Massachusetts

D. SUGGESTED SITES FOR FIELD TRIPS, RESOURCE PERSONS AND INFORMATION

1. WAGA TV (Channel 5)
   1551 Briarcliff Road, N. E.
   Atlanta, Georgia
2. WHAE TV
   1733 Clifton Road, N. E.
   Atlanta, Georgia
3. WQXI TV (Channel 11)
   1611 West Peachtree Street, N. E.
   Atlanta, Georgia
4. WSB TV (Channel 2)
   1601 West Peachtree Street, N. E.
   Atlanta, Georgia

PHOTOGRAPHY

Careers in Communication and Media

Grade 6

Teachers Resource Guide

INTRODUCTION TO PHOTOGRAPHY

Planning and implementing an activity-centered unit on photography at the sixth grade level is one effective means of presenting the science curriculum concepts related to light. Through their participation in unit activities, students can see and experience a concrete application of some very abstract concepts -- an application that may aid understanding and stimulate interest in other science concepts.

I. GOALS, OBJECTIVES AND CONCEPTS

A. TEACHER GOALS

1. To broaden the student's knowledge of himself and the work community.
2. To give the student a concrete application of the abstract science principles of light.
3. To stimulate the student's awareness of community work roles related to the photography industry.
4. To broaden the scope of the student's experiences by incorporating content and skills into activity-centered learning situations.
5. To provide the student varied experiences to help him evaluate his abilities and interests, and to determine personal values.
6. To help clarify the student's understanding of his role as an individual contributor to the cooperative effort.
7. To help the student learn to work with both on his own initiative and as a member of the group.
8. To provide the student additional opportunities to develop decision-making skills by involving him in the decision-making process.
9. To encourage the student to think for himself.
10. To stimulate the student's realization that all work roles have merit, deserve respect and contribute to a functioning society.

B. LEARNER (BEHAVIORAL) OBJECTIVES

NOTE: These objectives may have to be adapted to fit the special abilities of individuals within a class.

1. By the end of the unit study, the learner will be able to recognize, spell and define briefly a minimum of 75% of the vocabulary terms introduced. Also, he will be able to use them correctly in the context of written work and oral activities.
2. The learner will be able to diagram graphically the structure of the human eye and label the major parts.
3. The learner will be able to summarize briefly the theory of the refraction of light.
4. The learner will be able to construct a simple pin-hole camera from an oatmeal container, cigar box or other materials.
5. The learner will be able to name a minimum of ten (10) work roles associated with the photography industry.
6. The learner will be able to describe some of the duties and characteristics of those ten (10) work roles with 75% accuracy in the descriptions.
7. The learner will be able to relate a working definition of the term, tool and name several examples of tools used by photography workers.
8. The learner will be able to prepare a brief written report (3-5 paragraphs) on an area of interest, such as the history of photography, famous names in photography, ways photography is utilized in various fields, etc. In preparing the report, the learner will utilize his reading, note-taking, composing, paragraphing, punctuating, spelling and handwriting abilities.
9. The learner will be able to relate the structure of the human eye to the operation of the camera.

C. CONCEPTS

*1. Photography is a Greek word which means essentially, "to write light." One source describes photography as the process of rendering optical images on photosensitive surfaces.

2. Involved in the process of photography are a necessary ingredient, (light) an instrument (camera) that takes in light to make and retain an image on a light sensitive surface (film).

**3. Photography has been described as a form of communication, a vital language for today's world.

4. A sophisticated method of creating a visual representation of people, places and events, photography was preceeded by painting, sculpting, carving and other forms of expression.

***5. In the nineteenth century, a Frenchman (Louis Daguerre) decided to experiment to find a better way to "take" a picture than painting it. His 1839 camera was a model which used a bulky, light-sensitive metal plate rather than film. The pictures produced by his method were known as daguerrotypes.

***6. This early camera, and others like it, produced fair results but had one major drawback. The plates which received the images had to be wet with chemicals, necessitating the almost "instant development" of the picture before the chemicals dried.

***7. Further refinements ended the problem of transporting a darkroom to develop the prints. In 1888, George Eastman perfected roll film for use in the camera he had invented earlier, which he named the Kodak.

***8. From the time of the invention of the Kodak to the present, many further refinements of the camera have been made. New developments include the introduction of color film and the invention of the Polaroid camera by Dr. Edwin Land.

***9. The Polaroid is a camera that develops its own pictures within a brief ten (10) second period.

10. New cameras and photographic equipment that have been developed and refined are used for widespread purposes such as underwater photography. aerial photography in mapmaking, industrial photography of machinery and processes, scientific photography and many other purposes.

11. Today, photography is both a source of enjoyment and relaxation as a hobby and a source of employment for many people.

II. SUBJECT MATTER

* A. DEFINITION OF TERMS

1. Camera: Any apparatus for taking photographs, generally consisting of a lightproof enclosure having an aperture with a shuttered lens through which the image of an object is focused and recorded on a photosensitive film or plate.

* American Heritage Dictionary
** Hood, Find A Career in Photography
*** Kohn, Photography

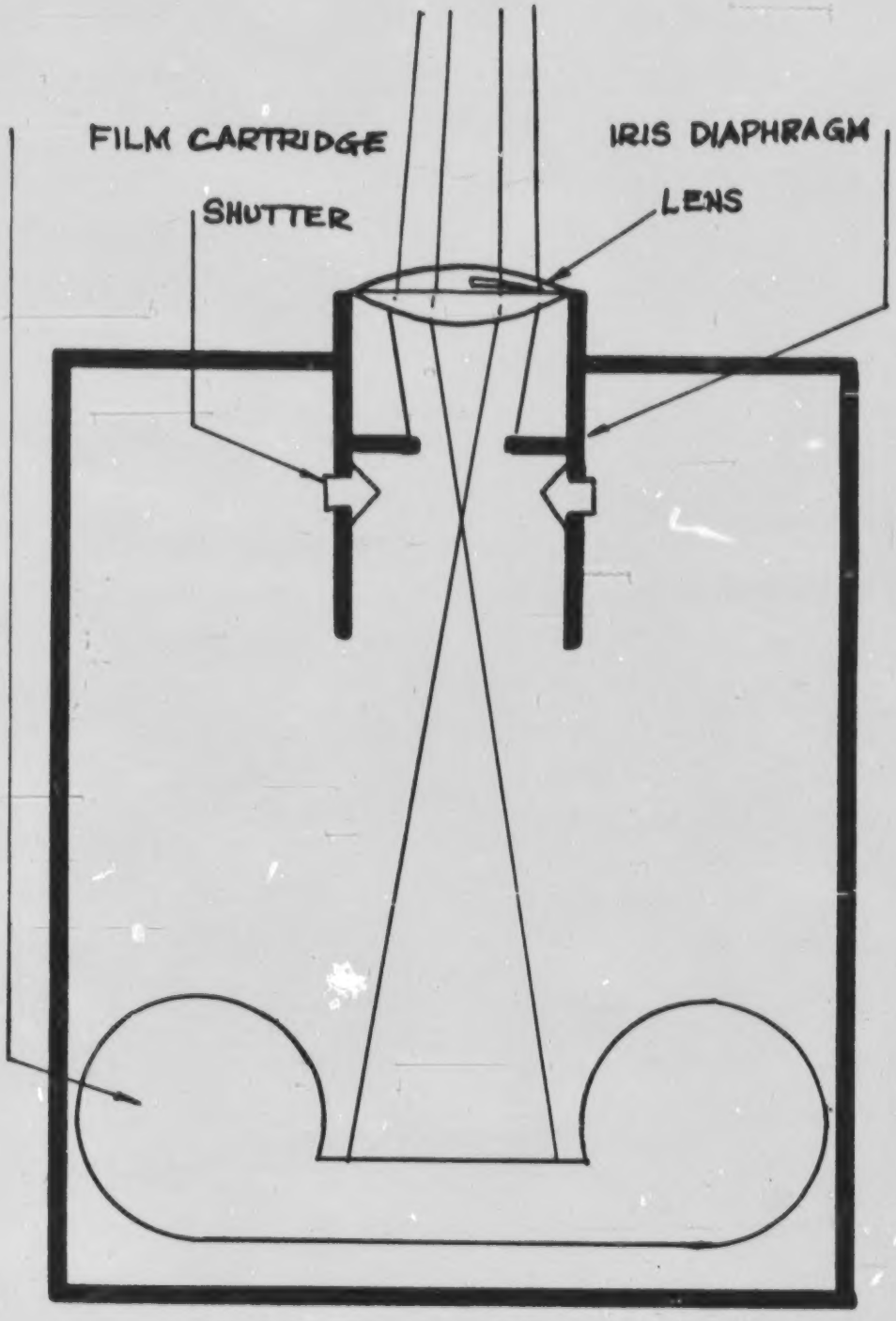
2. Photography: (a) The process of rendering optical images on photosensitive surfaces. (b) The art, practice, or occupation of taking and printing photographs.

B. VOCABULARY

1. Camera
2. Career
3. Color
4. Convex
5. Daguerrotype
6. Developing
7. Film
8. Fixer
9. Image
10. Lens
11. Photographer
12. Photography
13. Photosensitive
14. Polaroid
15. Portrait
16. Printing
17. Property
18. Refraction
19. Stop Bath
20. Studio

*C. DIAGRAM OF A SIMPLE CAMERA (SEE NEXT PAGE)

* American Heritage Dictionary



SIMPLE CAMERA BODY

III. OCCUPATIONAL INFORMATION AND DESCRIPTION

A. GENERAL DESCRIPTION

Opportunities in the field of photography and its related areas are many and varied. According to Find a Career in Photography, photographers' work roles alone may be broken down into forty (40) divisions including aerial, architectural, commercial, public relations and travel photographers.

In addition to the jobs involving work with a camera, there are many support roles in the photographic industry. There are many jobs available in the photo supply manufacturing, sale and repair business and in the photofinishing, photoengraving and photolithography fields.

Photographic skill and knowledge may be combined with skills in other areas such as journalism or editing.

B. JOB ENTRY AND PREPARATION

Depending upon the area of photography a person is interested in entering, job preparations vary. Some jobs such as portrait or studio photographers need a sound business education (college training), good photographic skills gained from attending a photography school and an eye for color, line, faces and arrangement.

Other jobs in photography can be gained through an apprenticeship, on-the-job training period plus a basic education and general ability.

Pursuing photography as a hobby can provide valuable experience for an individual interested in gaining possible employment in the field.

C. GENERAL REQUIREMENTS

Some of the requirements for some jobs in photography are manual dexterity, mechanical or artistic ability, quickness, the ability to work alone without supervision, good reflexes, an eye for line, arrangement and color, ability to pay attention to details plus the necessary training and education for the job.

Both men and women can pursue most jobs in photography.

D. WORKING CONDITIONS AND BENEFITS

The different types of photography occupations offer different kinds of working conditions. For instance, a free-lance photographer may operate on a very flexible schedule and may work only when he wants to. Studio or commercial photographers may not be so flexible in their hours and arrangements -- some travel might be involved in their jobs, but their schedules are probably less flexible.

Fashion or advertising photographers may operate on a very tight schedule,

with deadlines for publication being a determining factor.

Other photography workers such as photofinishers, engravers, salesmen, repairmen, etc., may work regular hours.

E. SAMPLE CAREER LISTINGS

1. Photofinisher
2. Photodeveloper
3. Retoucher
4. Photolithographer
5. Photoengraver
6. Color Finisher
7. Chemist
8. Chemical Engineer
9. Photo Supply Manufacturer
10. Manufacturer's Representative
11. Technical Representative
12. Technical Correspondent
13. Demonstrator
14. Enlarger
15. Camera Repairman
16. Equipment Repairman
17. Supply Salesman
18. Portrait Photographer
19. Advertising Specialist
20. Photographer's Assistant
21. Commercial Photographer
22. Industrial Specialist
23. Aerial Photographer
24. Photogrammer
25. Public Relations Specialist
26. Photojournalist
27. Sports Photographer
28. Magazine Photographer
29. Scientific Photographer
30. Police Photographer

IV. SUGGESTED MOTIVATION ACTIVITIES

A. Plan and design an attractive bulletin board display of photographs from magazines and newspapers. Try to select photos that are particularly vivid, colorful and that depict a lot of action. Call the students' attention to the display and use it as a visual aid to initiate a discussion of photography.

B. Initiate a discussion of photography by presenting a question such as: What is meant by the statement, "A picture is worth 1,000 words?" Use motivating questions to help guide the discussion.

C. Create an Interest Center in the classroom by collecting books on science and photography, magazines with numerous pictures, (LIFE, NATIONAL GEOGRAPHIC, SPORTS ILLUSTRATED, SEVENTEEN, PHOTOGRAPHY, etc.) individual film loops, teaching tapes and other appropriate material. Encourage students to investigate the materials at their leisure.

D. Select and show an appropriate film, filmstrip or loop to the youngsters. Appropriate choices might be: "Photography: A History," and "Elementary Photography," (Charles Clark Audio-Visuals). Have a discussion session afterward to help students verbalize their reactions to the presentation.

E. Make a display of "Tools of the Trade" of the photographer in one area of the room. Some items to display might include a box camera, an instamatic, a Polaroid camera, a movie camera, any type of camera in which the focal length must be adjusted before taking the picture, a light meter, flash attachment, etc. Identify the items, label them and talk about who uses them and how.

F. If the actual "tools" of the photographer aren't available, substitute pictures of the tools and make a bulletin board display.

G. Motivate the students through the science activity of making a pin hole camera from an oatmeal container, cigar box and other materials. Have each student make his own individual camera. (See Appendix)

V. SUGGESTED STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. Begin motivation activities and use throughout the unit to stimulate and maintain student interest.
2. Have a planning session with students to determine directions for the unit study. Use the question, "What's worth knowing about photography?" to guide the planning. Encourage one (1) or more students to keep notes of ideas presented.
3. Identify possible activities resource people and field trip sites to enhance the unit study. Allow the class to divide into several small committees or interest groups (2-5 persons) to do projects and to handle responsibilities.
4. Begin gathering materials and resources for class media center. Science texts and activity books, library books on photography, magazines, filmstrips, a model of the human eye and other resources would be useful. Utilize them in doing research for projects.
5. Outline areas of interest for group and/or individual research projects. Topics for research might include: a short history of photography, famous names in the field, ways photography is utilized, speciality areas in the field, the impact of photojournalism, photography as an art form and many others.
6. Begin a Current Events folder or bulletin board, using newspaper and magazine clippings collected by the students. Have the person bringing in the clippings share it orally with the other class members.
7. Prepare and give a brief Interest Inventory or pretest if one is desired. Or, give the class an Expectations Sheet on the question, "What do you expect to learn from the photography unit?" and keep records of the results.
8. Lead the class in developing an appropriate Interview Form with questions for resource persons and workers observed on field trips. Also, develop a reporting form for group and individual research projects.

B. RESEARCH ACTIVITIES

1. Have some of the class committees begin work on posters and other "tangible evidence" for the classroom. Include such posters as:
   a. Diagram of the human eye.
   b. List of photography work roles identified.
   c. Diagram of simple camera.
   d. List of vocabulary terms and definitions.

e. List of developments in photography.
f. Chart of different types of cameras.
g. List of directions for operating a camera.
h. Chart of steps for developing or printing photographs.

2. Begin identifying some of the different career areas and work roles in the photography industry and do research to determine some of the work role characteristics, job duties and educational/skill preparation of each one.

3. Do some investigation into the history of the camera and the field of photography, identifying famous names such as Louis Daguerre, Matthew Brady, Eastman, and Polaroid, etc. Research some early cameras, discussing drawbacks and talking about improvements that have been made.

4. Use various audio/visual materials to help students understand the principles of the refraction of light and how those principles are illustrated in the operation of the camera. Possible choices are "Light and How It Travels," (filmstrip - Jam Handy) "Reflection and Refraction," (transparencies - DCA) and "What Is the Nature of Light?" (teaching tape - Georgia Catalog)

5. Plan a discussion of some of the ways photography is utilized in various fields such as journalism, advertising, science, real estate, industry, etc. Do some investigation in this field, utilizing a resource person as an aid in instruction. Also, try to get pictures illustrating the various uses and post them on the bulletin board.

6. Use illustrated materials or a model of the human eye to help students understand the structure and functions of the human eye. Relate the functions of the eye to the operation of the camera.

7. Incorporate role playing situations into classroom activities to allow youngsters to experience some of the characteristics of photography work roles. If cameras and film are available, provide each student or group equipment to take pictures. After the pictures have been taken, involve students in the developing and printing of the snapshots. Or, set up a simulated photography studio, camera supply store or other appropriate site for role playing activities. Be sure to involve every student and follow up the activity with a "talk-it-over" session to help students verablize their reactions to their roles.

C. CORRELATING ACTIVITIES

1. Language Arts
   a. Have students utilize their composition, punctuation and penmanship skills in composing and writing letters to various sources requesting information and materials.
   b. Make a study of vocabulary terms introduced during the unit -- writing them on poster paper and displaying in the room. Add to

the lists as new words are introduced and call the students' attention to the lists.

c. Encourage students to make reading reports from books or magazines related to the unit. Have them practice their oral presentations using a tape recorder as an aid in preparing for their reports.

d. Have students collaborate on preparing an interview form to use on field trips and with resource people. Talk about appropriate questions to ask and word them carefully.

e. Give the students practice in composing a story or captions to accompany pictures or snapshots that they have made in other activities.

f. Provide students the opportunity to research an area of interest to them in studying photography. Students could choose a topic, research it using library materials and other sources, take notes, etc.

2. Mathematics

a. Utilize students' computation (addition, subtraction, multiplication, division) skills in working word problems related to costs of paper, chemicals, film and other materials. They could add total costs for expenditures, subtract expenditures from a budget, multiply costs per individual picture times total numbers of pictures, divide total costs by the number of pictures and other operations, etc.

b. Have students practice their measuring skills in measuring chemicals for developing and printing snapshots. Stress the importance of accurate measurement in this activity.

c. Incorporate the study of linear measure (inches, feet, yards) into the photography unit by relating it to layout and design. Use measurement skills in laying out photographs for a bulletin board or other display.

d. Emphasize the importance of accurate measurement of time, temperature and liquids in the photography process. Talk about how time is measured in seconds in developing and printing photos and how vital split-second timing is in that process; discuss the importance of measuring temperature and liquids accurately, etc. Talk with the students about what might happen if measurement weren't accurate.

e. Relate the study of fractions (¼, ½, ¾) to the measurement of chemicals in the development and printing of photographs.

3. Science

a. Lead the class in investigating light and its various properties such as reflection, refraction and diffraction. Define basic terminology and introduce the wave and particle theories of light for discussion. Audio-visual aids such as "Learning About Light," (film -- Georgia Catalog) or "What is the Nature of Light?" (teaching tape - Georgia Catalog) might be helpful here.

*b. Do some simple experiments to illustrate the principle of the refraction of light. One simple activity involves an aquarium or small plastic box for holding water and a dowel or ruler. Fill the container about three-fourths (¾) full of water, place the stick in the water and look at it from above the water. Make observations about the appearance of the stick in the water, them remove the stick to see if it is actually bent or straight. Help the students draw some conclusions from this activity.

c. Do some work with lenses to help illustrate some of the properties of light. Using a convex lens, project the image of a burning candle on a paper screen -- the image will be upside down.
d. Bring in a model of the human eye -- identify the major parts and describe the functions of each one. Have each student make a diagram, drawing or model of the eye, then relate the functions of the eye to the "eye" of the camera.
e. Follow up the previous activity by making a pin-hole camera from an oatmeal container or cigar box and other materials. (See Appendix) Have each student make a camera to observe the image made by light passing through a pinhole.
f. Study a diagram of a simple camera, identify the parts and lead the students in developing an explanation of its functions and relation to the human eye.
g. Do experiments with a prism to analyze the colors in light -- produce a spectrum if possible using a prism and sunlight or a pan of water and a small mirror. Discuss how these properties of light and color are important in photography.

4. Social Studies
a. Lead the class in discussing the role of photography as a means of recording our culture -- talk about the various ways that photography is utilized today in journalism, science, protective services, art and other fields to record events. Compare and contrast photography with other means of recording culture used in the past and today.
b. Help the students define the term, tool, in relation to the photography worker. Identify some common examples of tools used by these workers, describe their functions and talk about how these tools are utilized. Have the students identify some tools they use in doing their school work.
c. Encourage the students to discuss their hobbies and recreational activities -- discuss the popularity of taking, developing and printing pictures as a hobby for many people. Try to invite a resource person who enjoys photography as a hobby to come in and discuss it with the children.

5. Art
a. Discuss the techniques of various artist/photographers -- the ways in which they use principles of form, line, arrangement, color, and texture. Display some prize-winning photographs as illustrations.
b. Design a mural depicting various phases of the photography field. Use butcher paper and tempera paint or chalks.
c. Assemble photographs taken by the students into booklets or folders accompnied by captions or descriptions.
d. Use color photographs cut from magazines to make collages depicting a single theme or topic. Allow the students to do this project individually or in groups.

6. Music
   a. Choose selections of music to fit the mood of photographs or slides taken by the students. Work up a multi-media presentation to depict a feeling, a story or event.

D. SUGGESTED HANDS-ON ACTIVITIES
1. Provide students materials and directions for making pin-hole cameras for use in science activities. (See Appendix).
2. Try to obtain enough simple cameras for every youngster or group to learn to operate one. Also, try to get film so that the students can have the opportunity to make one or more pictures of various subjects.
3. Obtain materials and equipment to set up a class "darkroom" project to develop and print pictures made by the students. Give each student the opportunity to try his hand at the developing and printing process. (See Appendix)
4. Take finished pictures and mount in an attractive display booklet or on a bulletin board.

E. SUGGESTED CULMINATING ACTIVITIES
1. Invite another resource person to visit the class to share experiences and ideas with the youngsters. Prepare the students before the visit with questions to ask the resource person.
2. Plan and take a field trip to a community site of interest. The Kodak plants in the metro Atlanta area, photo supply companies and studios, and other sites would be appropriate. Follow up the visit with a talk-it-over session.
3. Complete hands-on activities and display finished snapshots in the room. Invite other students, teachers, adults and parents in to see the displays.
4. Have individuals or groups give final reading or research reports. If the reports are written, post them in the room for others to read.
5. Give a concluding Interest Inventory, Expectations Sheet or post-test to determine levels of students' interest or knowledge. Compare results with pre-test assessment.
6. Re-show any interesting films or filmstrips in the light of students' present knowledge.
7. Encourage the students to express verbally their feelings about and reactions to the unit activities in a talk-it-over session.

F. SUGGESTED FOLLOW-UP ACTIVITIES
1. Continue to use vocabulary terms from the unit in oral activities and written assignments to help reinforce learning.
2. Play the "Knowledge Game" with questions taken from the photography unit.
3. Continue taking pictures of classroom and school activities to display in the classroom.

IV. MATERIALS AND EQUIPMENT NEEDS

A. Construction Paper
B. Poster Paper
C. Magazines and Newspapers
D. Audio/Visual Materials
E. Projector
F. Tape or Cassette Recorder
G. Camera and Film
H. Camera Equipment
I. Oatmeal Container
J. Cigar Box
K. Rubber Band
L. Waxed Paper
M. Black Paper
N. Developing Tank
O. Photographic Thermometer
P. Vicose Sponge
Q. Universal Developer
R. Fixing Bath
S. Timer
T. Graduate and Funnel
U. Brown Bottles
V. Film Clips
W. Developing Trays (5" x 7")
X. Printing Frame
Y. Printing Paper (2½"x3½")
Z. Acid Stop Bath
AA. Tongs
BB. Yellow Safelight
CC. Timing Device
DD. Light Source (bulb)
EE. Library Books
FF. Textbooks
GG. Magic Markers
HH. Cork
II. Metal Foil
JJ. Drill
KK. Convex Lenses
LL. Candle
MM. Butcher Paper
NN. Tempera Paint
OO. Masking Tape
PP. Ruler
QQ. Paintbrushes
RR. Prism
SS. Plastic Box

VII. EVALUATION

A. SELF-EVALUATION

1. Did I attain all the goals I had set for myself as a teacher?
2. Did I incorporate all six (6) elements of the Career Development approach into the unit study?
3. Did I involve all youngsters to the maximum extent possible in the planning and coordinating of unit activities?
4. Did I plan effectively, utilizing methods and materials wisely?
5. Did I generate the maximum level of interest and participation through effective and reinforcing motivational activities?
6. Did I encourage students to verbalize their feelings and reactions following role playing activities?
7. Did I maintain a classroom atmostphere conducive to learning?
8. Did I use the most effective means of correlating the subject matter?
9. Did I facilitate expressions of both individual initiative and group interest?
10. Did I plan activities so as to individualize instruction as much as possible?

B. OBSERVATIONS OF THE CHILD

1. Observe the flexibility of individual role interaction within the group.
2. Observe for evidence of individual research and task completion.

3. Observe for evidences of strengthening of individual self-images.
4. Observe the youngster's ability to apply his abstract knowledges to concrete learning situations.
5. Observe the student's use of communication skills both as an individual and as a member of the group.
6. Look for evidence of social interaction skills -- does the child accept responsibility willingly, complete tasks, share materials, take turns and communicate well with his peers?
7. Observe for any evidence of change in attitude toward school-related activities and the work community.

C. WRITTEN EVALUATION (PRE AND POST TEST IF DESIRED)

1. Match the word in the left column with its correct meaning in the right. Write the letter of the correct meaning in the blank beside the word.

____	Camera	a.	The process of making optical images on light sensitive surfaces.
____	Career	b.	The bending of light as it passes from one substance into another.
____	Photography	c.	Any apparatus for taking photographs.
____	Refraction	d.	A chosen life work.

2. Name as many workers as you can whose work roles are related to the the field of photography.
3. What is meant by the term, <u>tool?</u> Can you name some examples used by photography workers?

VIII. <u>AUDIO/VISUAL AND RESOURCE MATERIALS</u>

A. Audio/Visuals

1. Films
   a. "Colors and Light: An Introduction"
   b. "Learning About Light"
   c. "Light All About Us"
   d. "Light and Dark"

GEORGIA CATALOG OF CLASSROOM TEACHING FILMS, 1972-75

2. Filmstrips and Loops
   a. "Careers in Film Making"
   b. "Careers in Photography"
   c. "Elementary Photography" (series)
   d. "Photography: A History"

CHARLES CLARK AUDIO/VISUALS FARMINGDALE, NEW YORK

   e. "Light and Color"
   F. "Light and How It Travels"

JAM HANDY -- CALHOUN AUDIO/VISUALS ATLANTA, GEORGIA

3. Overhead Transparencies
   a. "Reflection and Refraction"

DCA CALHOUN AUDIO/VISUALS ATLANTA, GEORGIA

4. Teaching Tapes
   a. "Career in Science"
   b. "Eyes to See"
   c. "What is the Nature of Light?"

GEORGE CATALOG OF TEACHING TAPES, 1968-1972

B. RESOURCE MATERIALS

1. Teacher Bibliography
   a. Gernsheim, Helmut and Alison, A Concise History Of Photography, New York: Grossett and Dunlap, 1965.
   b. Henle, Fritz, Photography for Everyone, New York: Viking Press, 1964.
   c. Jacobs, Lou, You and Your Camera, New York: Lothrop, Lee and Shepard, 1971.

2. Additional Resources
   a. Dictionary of Occupational Titles, U.S. Government Printing Office, Washington, D.C. 20402.
   b. Elementary Science Discovery Lessons -- The Physical Sciences, (Sund, Tillery and Trowbridge) Allyn and Bacon Publishers, Boston, Massachusetts.
   c. Occupational Outlook Handbook, U.S. Department of Labor, U.S. Government Printing Office, Washington, D.C. 20402.
   d. Photography in Your Future, Eastman Kodak Company, Rochester, New York.
   e. SRA Occupational Briefs, Science Research Associates, 259 E. Erie Street, Chicago, Illinois 60611.
   f. Yellow Pages of Learning Resources, M.I.T. Press, Cambridge, Massachusetts.

IX. CHILDREN'S BIBLIOGRAPHY

A. Abel, Photography, Chilton Press, 1961.
B. Biever, Young Sports Photographer with the Green Bay Packers, Grossett, 1970
C. Hoke, John, The First Book of Photography, New York: Franklin Watts, 1954.
D. Hood, Robert, Find A Career in Photography, New York: G. P. Putnam's Sons, 1959.

E. Kohn, Eugene, Photography: A Manual for Shutterbugs, Englewood Cliffs, New Jersey: Prentice-Hall, 1965.
F. Mergendahl and Ramsdell, What Does a Photographer Do?, New York: Dodd, Mead and Company, 1965.

APPENDIX A

MAKING A PIN-HOLE

Observe the image made by light passing through a pin-hole. To do so, place some waxed paper or tissue paper over the open end of a round cereal box, fastening the paper with a rubber band. Punch a tiny pin-hole in the closed end of the box. Wrap a sheet of black peper around the box, so that the sheet extends beyond the end of the waxed paper. Fasten the black paper in place with a rubber band. The paper will act as a light shield. Place your face up to the shield so that you block out all outside light from your eyes. Look at an object that is about one hundred (100) feet away. The object will appear to be inverted.

APPENDIX B

MAKING A PIN-HOLE CAMERA

Materials: cigar box, cork, metal foil, photographic film, drill.

Procedures:

1. Drill a half-inch (½) hole in one end of the cigar box. Fit a cork tightly into this hole.
2. On the inside, tape a one (1) inch square of metal foil over the hole. With a needle, punch a clean hole exactly in the center of the foil.
3. In a dark room, tape a piece of photographic film on the end of the box directly opposite the needle hole.
4. Fasten the lid of the box tightly and secure the cork in the hole before going out in the daylight.
5. Outdoors, point the camera toward the object. Rest it on something to keep it from moving.
6. Remove the cork for one (1) or two (2) seconds depending on the brightness of the day.
7. Develop the film.
8. Experiment with different times of exposure and a variety of light conditions.

APPENDIX C

DEVELOPING NEGATIVES

Equipment Needed: developing tank, photographic thermometer, vicose sponge, universal developer, fixing bath, timer, graduate and funnel, brown bottles, film clips.

Procedures:

1. Find a room to use as your dark room. No light must enter this room.
2. Take the developer and fixer and mix in bottles. Follow directions on the packages.
3. Enter the darkroom and remove the film from the reel of the camera and load it onto the reel of the developing tank. (Practice this step in the light with a reel of inexpensive, unexposed film until it can be done in the dark.) Close the developing tank and leave the dark room.
4. Check the temperature of the developer. It should be between 65^{o} and 70^{o} F.
5. Pour the developing fluid into the tank and note developing time on the directions. Start timing as soon as you begin to pour the fluid into the tank. Turn the spindle to agitate the fluid for about five (5) seconds every minute.
6. Pour the developer back into its brown bottle and fill the tank with water at the same temperature of the developer (65^{o} - 70^{o}F.) Agitate for a minute and pour out the water.
7. Fill the tank with fixer at the same temperature as the developer and the water. Agitate it as you did the developer, five (5) seconds every minute. After ten (10) minutes, pour out the hypo. Check one (1) corner of the film. If it has a milky appearance, put it back in fresh hypo for about five (5) minutes.
8. Uncover the tank. Put it under a tap and let water, at about 70^{o}F, run over it for about twenty (20) minutes.
9. Take the negatives off the reel and put film clips on the ends. Hang it up to dry. Wipe off excess water with a sponge.

APPENDIX D

PRINTING NEGATIVES

Equipment Needed: three (3) plastic developing trays (size 5 x 7), printing frame, printing paper (2½ x 3½ in.), acid stop bath, tongs (2 pairs), yellow safelight, timing device, light source (40 watt bulb).

Procedure:

1. Arrange equipment in a fairly dark room.
2. Arrange the trays in 1, 2, 3 order. Pour developer in the first and the hypo in the last. The temperatue for both should be 68^{o}F.
3. Mix the acid stop bath according to directions and pour it into the middle tray.

4. Put one of the tongs on the edge of the developer tray, and the other on the hypo or stop bath tray. Always keep the developer tongs out of other solutions. Also, keep the printing paper away from any light except the safelight.
5. Cut the negatives to print one at a time.
6. Turn out all lights but the safelight. Mount the negative and printing paper (emulsion side up) in the printing frame.
7. Take the frame and place under the lamp with the 40-watt bulb. Turn on the light for exactly three (3) seconds. Then turn it off.
8. Take the exposed printing paper out of the frame and place in the developer, emulsion side up.
9. Pick up with the tongs and drop into the second tray, the stop bath. Don't let the developer tray touch the liquid.
10. After ten (10) seconds, use the other tongs to put the paper into the final tray, the fixer. Leave for ten (10) minutes. You may begin another print while one is in the fixer.
11. Wash the print with running water in a partially filled sink for one (1) hour. Agetate every ten (10) minutes.

BUILDING CONSTRUCTION

Careers in Construction

Grade 6

Teachers Resource Guide

INTRODUCTION TO THE BUILDING CONSTRUCTION INDUSTRY

Students are introduced to a variety of workers and their roles in the building construction business through some concrete experiences and resource persons. An attempt is made in this unit to help students with different experiences understand the great variety of both skilled and unskilled occupations in the building construction field. Developing a positive self-concept and successful experiences in related school activities enhances the selective powers of the individual child in choosing his occupation, or beginning career.

This unit helps the student to discover the relationship between mathematics at school and on the job.

I. GOALS, OBJECTIVES AND CONCEPTS

A. TEACHER GOALS

1. To stimulate the student's realization that all areas of work are dignified, deserve respect and contribute to a wholesome society.
2. To encourage the student to exercise creativity and to discover a variety of ways to reach solutions through active inquiry.
3. To provide the child exploratory experiences necessary to help him evaluate his abilities and interests, and to determine personal values.
4. To encourage the student to think for himself.
5. To expand the student's attitudes about the work community and his relation to it.
6. To broaden the base of the student's experiences by incorporating content skills into activity-centered learning situations.
7. To create additional opportunities for the child to participate in the decision making process.
8. To provide opportunities for both individual activities and participation in the group process.
9. To broaden the student's knowledge of the functions and operations of the building construction industry.
10. To stimulate social interaction skills as the individual functions within the group.

B. LEARNER (BEHAVIORAL) OBJECTIVES

1. By the end of the unit study, the learner will be able to spell and define briefly 75% of the related vocabulary terms.
2. The student will be able to list a minimum of ten (10) workers whose jobs are directly related to the building construction industry.
3. The learner will be able to describe the appropriate duties of these ten (10) workers with 75% accuracy in the descriptions.
4. Given a list of a number of building construction workers and their job duties, the learner should be able to match the workers with their respective duties with 75% accuracy.
5. Given a set of construction workers' pictures and job titles, the learner will match 75% of the pictures with the appropriate job titles.
6. The learner will be able to identify and describe three (3) ways in which mathematics knowledge is used in the building construction industry.
7. The student will be able to relate a working definition of the term, tool, identify at least five (5) examples of tools used by carpenters and describe their uses.
8. The learner will be able to identify and describe the uses of a minimum of six (6) different building materials.
9. In either an oral or written discussion, the learner will be able to summarize the effect weather has on the building trades, mentioning at least three (3) different weather conditions and describing their effects.

10. The student will be able to make scale drawings of a simple house plan, converting feet into ¼ inches and drawing to scale.

C. CONCEPTS

1. The construction industry is one involved in the construction, maintenance, repair and alterations of homes, other types of buildings, highways, airports and other structures.
2. Construction projects include single family and multiple unit dwellings; commercial and industrial buildings; road, bridge and highway building and other similar jobs.
3. In many ways, (number of employees, impact on national economy, etc.) the building construction industry is one of the largest in the United States.
4. Building trades craftsmen are those workers involved in the construction industry.
5. According to CAREERS IN THE BUILDING TRADES, the construction industry offers more jobs than any other industry and its workers constitute about one-third (1/3) of all skilled workers in the nation.
6. More than two dozen trades are included in this industry but the greatest concentration of workers are found in these six (6); carpenters, painters, plumbers and pipefitters, brick layers, power-equipment operators and construction electricians.
7. In addition to those people actively involved in construction, there are many more employed as support personnel in the manufacturing, transporting and distributing industries which supply the active workers with equipment, tools and materials.
8. There are many different levels of employement in the active construction industry; thus making entrance requirements varied, depending upon the degree of skill of the position.
9. The largest percentage of building-trade workers are organized into labor unions.
10. Some jobs in the building construction industry do not require a college degree, but most all demand a sound basic education, manual and physical dexterity and mental alertness.
11. Black and White people often work together on many construction projects. Most all workers involved in active construction jobs are men.
12. Construction workers often have to travel away from their homes in connection with their jobs.
13. To manage or supervise a building construction project requires extensive knowledge of both people and materials.
14. Weather conditions, especially rain and severe cold, do interfere with some phases of building construction.
15. The building industry has a long and interesting history -- actually, building is older than written history.
16. Early man began building dwellings of reeds, stick, stones, and even bricks after he emerged from the cave.

17. In ancient Greece and Rome, there were regulations governing the building contracts made between large contractors and the government.
18. The American construction industry had its origins in England.
19. The construction industry, as it is known today, actually started after the civil war. Building flourished in this post-war period with the invention of structural steel, iron and portland cement, and the growth of steam-operated machinery.
20. Techniques of mass production were utilized and the building trades grew more diversified, including new skills such as plumbing and steam fitting.
21. The United States is chiefly responsible for introducing some new techniques and equipment to building, including the first skyscrapers; steam shovels; mechanical elevator; the mass produced frame house and the modern method of constructing housing projects.
22. Most every kind of known material is now used in construction; brick, stone, plaster, lumber, plastics, steel, aluminum, glass and concrete.
23. With the wide variety of jobs available and the number of building projects in operation, opportunities in the building industries are plentiful.

II. SUBJECT MATTER

A. DEFINITION OF TERMS

1. Build: (a) To form by combining materials or parts; to erect or construct (b) To give form according to a definite plan or process; to fashion or mold.
2. Construction: (a) The act or process of constructing. (b) The business or work of building.
3. Labor Union: An organization of wage earners formed for the purpose of serving their class interests with respect to wages and working conditions; a trade union.

B. VOCABULARY

1. Apprentice
2. Apprenticeship
3. Blue Print
4. Build
5. Construction
6. Contractor
7. Craft Union
8. Design
9. Drawing
10. Finish
11. Floor Plan
12. Journeyman
13. Labor Union
14. Maintenance
15. Material
16. Model
17. Prefabricated
18. Properties
19. Repair
20. Scale
21. Specifications
22. Tool

C. BASIC PRODUCTION CONCEPTS*

1. Clearing: The site must be cleared before construction can begin.
2. Earthmoving: Earthmoving is required to prepare the bearing surface for the foundation.
3. Foundations: Foundations are prepared to support the superstructure.
4. Superstructures: Superstructures are built upon the foundation.
5. Utilities: Utilities are installed to make the superstructure more funçtional.
6. Finished Project: The finished project will represent the thinking and planning of the building.

D. COLLECTIVE BARGAINING: BACKGROUND INFORMATION

1. A labor union is a group of organized workers who wish to bargain collectively.
2. These unions represent about one quarter of the total work force and involve workers in fields such as transportation, communication, manufacturing and construction.
3. Workers unite to form unions to work for more benefits such as better working conditions, increased pay and retirement benefits. Their strength as a group gives them the power to negotiate with the employer more effectively than they could as single individuals.

E. RECENT DEVELOPMENTS IN THE CONSTRUCTION INDUSTRY

1. Extensive use of power machinery.
2. Prefabrication of Homes:
   a. Prefabricated House: "Package" of materials sent preassembled to building site.
   b. Prefabricated Component: Any section or part of a house made from various pieces before delivery to building site.
   c. Precut House Package: Every piece is measured and cut to needed size before shipment so that building at site is facilitated.
3. Modernization and repair of homes and commercial buildings.

III. OCCUPATIONAL INFORMATION AND DESCRIPTION

A. GENERAL DESCRIPTION*

Representing about one sixth (1/6) of all industrial activity in the United States, the building industry employs the largest number of skilled craftsmen in the work force. There are more than two dozen different skilled building trades active in the field with journeymen representing the highest (craftsmen) level in each trade. Basically, the work done by journeymen may be grouped into three main categories:

Structural: Carpenters, operating engineers, stonesmasons, bricklayers, cement or concrete masons, reinforcing-, structural-or ornamental iron workers, riggers, boilermakers, etc.

Mechanical: Plumbers, pipefitters, electricians, millwrights, elevator constructors and sheet metal workers.
Finishing: Painters, lathers, plasterers, paper hangers, roofers, asbestos workers, glaziers, marble setters, terrazo workers, tile setters and floor coverers.

Building trades workers find employment with general contractors, special contractors, business concerns, government firms or themselves.

B. JOB ENTRY AND PREPARATION

Probably the best way to gain entry into one of the skilled building trades is through an apprenticeship training program in which the new worker spends time in both on-the-job training and classroom instruction. The combination of on-the-job training under the supervision of a skilled craftsman and classroom instruction in tools, materials, techniques and principles of the trade is very helpful to the beginner.

Other building trades workers learn their skills by observing skilled craftsmen at work while they themselves work as laborers or helpers. Some few other workers who do not have much skill or training can find temporary work as laborers or helpers while business is booming.

C. GENERAL REQUIREMENTS

A sound basic education with emphasis on math and science is a necessity for most beginning jobs in the building construction field. Applicants with advanced training in trade or industrial/technical school backgrounds have an advantage over other applicants.

In most skilled trades, considerable manual dexterity, mechanical aptitude and a good eye for line and color are required for successful work. Workers wishing to enter an apprenticeship program must be between the ages of eighteen (18) and twenty-five (25) and in good physical condition. Nearly all workers involved in active jobs in the construction industry are men.

In some crafts and in some areas of the country, union membership is a requirement for work in this field. Workers with a skilled trade usually belong to a craft union made up of members with similar skills.

D. WORKING CONDITIONS AND BENEFITS

Although hourly wage rates paid to skilled workers in this field are among the highest paid to skilled craftsmen, average annual earnings are not as high as the hourly rates of pay might indicate. Weather conditions, seasonal work and other factors affect the total earnings of these personnel. Overtime work after

regular hours or on weekends or holidays offers additional wages as does part-time or "moonlighting" jobs done by individuals.

Some element of danger is involved in this field since workers must often work on tall, unfinished buildings, operate dangerous equipment or work underground. A great deal of physical labor is involved with workers forced to spend sustained amounts of time standing, stooping, crawling or bending often in small areas.

The building trades offers the individual the opportunity to work outdoors, to find a financially rewarding position without an extensive college background, to exercise his personal skills to the utmost and perhaps most of all, the opportunity to enter business for himself as a contractor of subcontractor.

E. OCCUPATIONAL LISTINGS (OCCUPATIONAL OUTLOOK HANDBOOK, listings)

1. Architect (O. O. H. 221-228)
2. Carpenter (O. O. H. 367)
3. Draftsman (O. O. H. 211)
4. Bricklayer (O. O. H. 364)
5. Electrician (O. O. H. 376)
6. Plumber (O. O. H. 400)
7. Land Grader (O. O. H. 228)
8. Painter (O. O. H. 395-398)
9. Tile Setter (O. O. H. 388-391)
10. Secretary (O. O. H. 236)
11. Superintendent (O. O. H. 353)
12. Operating Engineer (O. O. H. 392-395)
13. Stone Mason (O. O. H. 409-410)
14. Cement Mason (O. O. H. 371-373)
15. Concrete Mason (O. O. H. 371-373)
16. Iron Worker (O. O. H. 410-413)
17. Rigger (O. O. H. 410-413)
18. Boilermaker (O. O. H. 410-413)
19. Pipefitter (O. O. H. 400-404)
20. Millwright (O. O. H. 484-486)
21. Elevator Constructor (O. O. H. 379-381)
22. Sheet Metal Worker (O. O. H. 406-409)
23. Lather (O. O. H. 385-387)
24. Plasterer (O. O. H. 399-400)
25. Paper Hanger (O. O. H. 395-398)
26. Glazier (O. O. H. 384-385)
27. Asbestos Worker (O. O. H. 362-364)
28. Marble Setter (O. O. H. 388-391)
29. Terrazo Worker (O. O. H. 388-391)
30. Floor Coverer (O. O. H. 381-384)

31. Laborer (O. O. H. 373-375)
32. Helper
33. Hod Carrier (O. O. H. 373-375)
34. Roofer (O. O. H. 404-406)
35. Contractor

IV. SUGGESTED MOTIVATION ACTIVITIES

A. Take the class on a field trip to see a construction site being prepared and observe a bulldozer or land grader at work. After the trip, have a discussion about what was seen.

B. Have a "student sharing" session in which youngsters relate knowledge or experiences they have in relation to the construction industry.

Perhaps some of them have seen new homes or buildings going up in their neighborhoods and can discuss those events.

C. Schedule an appropriate film such as "Building a House", or "The New House-Where It Comes From" to stimulate student interest. Have a question and answer period after the film.

D. Gather materials, posters and pictures for a bulletin board. Class members could be responsible for designing and making the display.

E. Obtain library books or magazines related to building construction and encourage students to read them during their free time.

F. Invite a resource person (contractor, carpenter, plumber, etc.) to visit the class and share experiences with class members. Prepare the class prior to the visit and have a "de-briefing.. session afterwards.

G. Plan a general class discussion about the whole field of construction. Try to get the students to name as many different types of construction as possible (single and multiple family dwellings, industrial and commercial buildings, roads and highways, bridges, public buildings, etc.) and identify the similarities and differences of operation among them.

V. STUDY ACTIVITIES

A. INITIAL ACTIVITIES

1. After the field of construction has been discussed as a whole, involve the students in selecting one area (house construction or some other area that is representative of the field) to investigate and in planning their activities.
2. Give a brief pre-test to determine students' interest and knowledge levels.
3. Using student interest as a guide, allow the class to divide themselves into three (3) groups to represent three (3) competitive building construction companies. Groups could then use research findings to choose names for companies and to determine personnel needs. (See Appendix A)

*4. Or, the class might be interested in doing a hands-on-project related to the construction of horizontal bars for the play-ground area. (See Appendix B)
5. Begin research into the field, visiting the library to obtain materials there and utilizing all available outside sources.
6. Individuals and groups could begin collecting blue prints and clipping floor plans from newspapers and other magazines.
7. Individuals could investigate some of the special clothing and uniform needs of various jobs, identifying different ones and discussing why protective clothing is needed for some of them.

B. RESEARCH ACTIVITIES
1. Utilize additional resource people to help students in their activities. (Architects, contractors, brickmasons, subcontractors, etc.)
2. Continue research into the occupational areas identified in this field. Research the characteristics of the job, the work duties and responsibilities, training and educational requirements, benefits and working conditions, etc. Each student could choose an occupation of interest to him and do an individual project related to it.
3. Interest groups could do research projects on such topics as the role of the labor union in the construction industry; new developments and materials in construction contrasted with those of the past; new architectural developments, etc.
4. Groups or individuals could do projects including: wall charts of occupational information; simple models of the cabin project with wood, cardboard, clay, paint; bulletin board displays of charts and pictures; scale drawings for floor plan of cabin project, etc.
5. Discuss the high costs of the big equipment used to grade land and to prepare sites for construction.

C. CORRELATING ACTIVITIES
1. Language Arts
   A. Encourage students to read stories, books, magazines and reports about the construction industry and workers in the industry. Book reports could be made on the material.
   B. Students could utilize oral communication skills in making telephone calls into the community to obtain prices for materials and to get other information about the building trades.
   C. Make vocabulary charts of new vocabulary words and occupational listings identified in the unit study. Have spelling games with the words to help reinforce learning.
   D. Individuals could write letters of appreciation to resource persons who visited the class to share information and experiences. Also, students could write letters of inquiry to other sources of information and materials.
   E. Students could make oral reports of interviews conducted outside class with representatives of real estate or the building construction

field. Tape these reports for future reference.

f. Each student could choose a job which interests him and locate additional information from the library or some other source. He could then report on his project to the class, using a visual aid such as a chart, graph, poster or illustration that he made.

g. Utilize both students' oral and written language skills in devising short skits or role playing situations related to the unit. Some sample situations might involve a foreman waiting on a shipment of wood so that his carpentery crews could begin framing a house; an apprentice applicant arriving for his first day on the job and any other appropriate situations.

2. Mathematics

a. Utilize basic math concepts of addition, subtraction, multiplication and division in figuring prices for materials and in computing total bids for the cabin project.

b. Introduce the concept of estimation as it relates to the construction industry. Relate this concept and that of rounding numbers to examples taken from building: estimating the number of board feet needed to frame a certain number of houses; estimating the number of bricks needed for a group of homes; the amount of pipes needed for a home; the amount of cement needed to pour foundations or driveways for a certain number of homes, etc.

c. Provide experiences in drawing room and floor plans to scale. Use ¼ inch as equal to one (1) foot.

d. Study shapes, pattern and design through the use of actual blueprints.

e. Talk about the various math skills used by workers in the construction industry: estimation; measurement; drawing to scale; computing prices and costs for materials and equipment in submitting bids, etc.

f. Use the concepts of area and perimeter in figuring square feet and total area of homes.

g. Provide experiences in computing averages of figures or sums as they relate to the construction industry.

3. Social Studies

a. In an introductory lesson, talk about man's need for shelter, how he has tried to satisfy it through the centuries. Do research to find out how early man constructed his shelter and what materials he used in the process.

b. Compare and contrast some of the materials used to construct homes today with those used long ago.

c. Plan a discussion about man's increased efficiency and effectiveness when he works with others in a cooperative effort. Use early man's struggles to build adequate shelter for his family as an example to contrast with the work of modern construction companies.

d. Students could investigate the building trends in their communities, identifying common types of buildings (homes, industrial or commer-

cial) and trying to determine what effects population, land availability and economic factors have on construction.

e. Introduce the terms labor union and collective bargaining, and define them, especially as they relate to the building trades. Do research on them -- the history of unions, the reasons for their formation, early labor leaders -- and have a panel discussion or debate on their pros and cons.

4. Science
   a. Discuss the applications of science to the building trades. Get examples of direct applications from students -- contractor's knowledge of materials and their properties, selection of materials and designs to withstand weather conditions, etc.
   b. After defining the terminology, make a study of tools and equipment used in the construction business. Identify different ones used by such workers as the carpenter or plumber and talk about their uses. Obtain examples or pictures of these to label and display in the classroom.
   c. Name some of the different materials used by construction workers in the building of different structures. (Glass, lumber, metal, iron, steel, aluminum, stone, brick, insulation, cement, plastic, concrete, marble, etc.) Talk about some of the properties of different materials and where and how they are used in building. Use glass as an example, discuss its properties (transparency, transluscence and opaqueness) and where it is used in building. Do the same with other materials.
   d. Discuss the uses of electricity in homes, the path of electricity through a building and fuses. Relate this concept to the wiring of the Question and Answer Boards.
   e. Investigate new sources of energy that may be utilized in heating and cooling homes and buildings in the future. (Solar and atomic energy) Do individual reports on them.
   f. Plan a discussion about the effects of weather on the construction industry. Identify different weather conditions (extreme heat, cold, ice, rain, snow, winds, etc.) and talk about how each of these conditions influence the building trades.

5. Art
   a. Make bulletin board of various processes in building construction.
   b. Make scrapbooks of different styles and kinds of homes from magazines.
   c. A mural of building construction workers could be made.
   d. Build models of the lake cabin -- paint them and landscape them to make more realistic.

D. CULMINATING ACTIVITIES
   1. Take planned field trip to prefabricated home manufacturer, construction site or contracting firm.
   2. Give post-test to evaluate changes (if any) in student interests and knowledge.
   3. Have companies present bids and plans for final consideration -- check them and determine the lowest complete bid.
   4. Reshow any films in light of present knowledge.
   5. Have a "wrap-up" discussion.
   6. Complete work on horizontal bars project.

E. FOLLOW-UP ACTIVITIES
   1. Use spelling and vocabulary words from time to time in spelling games and in writing activities.
   2. Display Question and Answer Boards and cabin project models in the room.

F. HANDS-ON ACTIVITIES
   1. One activity that simulates the work activities in the building construction industry is the youngsters' dividing themselves into construction companies, selecting a project and following it through. The companies could determine the amounts of materials needed, price them at building supply firms, prepare bid sheets and present them for consideration.
   2. In connection with the above activity, each group could build a model of the lakehouse or cabin, paint and landscape it.
   3. Students could design and construct the Question and Answer Boards, utilizing math skills in the layout and measure; science knowledge in the wiring and manipulative skills in the construction of the board.
   4. Students could plan and construct the horizontal bars for the playground.

VI. MATERIALS, SUPPLIES AND EQUIPMENT

A. Poster Board
B. Magic Markers
C. Construction Paper
D. Saw
E. Plane
F. Level
G. Ruler
H. Square
I. Hammer
J. Jig Saw
K. Drill
L. Nails
M. Sandpaper
N. Screws
O. Flashlight Batteries
P. Flashlight Bulbs
Q. Crayons
R. Clear Varnish
S. Plywood
T. Small Diameter Covered Wire
U. Scissors
V. Paint
W. Manila Art Paper
X. Blue Prints
Y. House Plan Catalogs
Z. Library Books
AA. Envelops
BB. Telephone
CC. Films/Filmstrips
DD. Magazines
EE. Bulletin Board Material
FF. Cardboard
GG. Clay
HH. Sand

II. Butcher Paper

JJ. Tempera Paint

VII. EVALUATION

A. SELF-EVALUATION

1. Did I plan effectively, utilizing methods and materials wisely?
2. Did I cover all six (6) elements of the Career Development approach sometime during the course of the unit study?
3. Did I generate the maximum level of interest and participation through effective motivation activities?
4. Did I maintain a classroom atmosphere conducive to learning?
5. Did I involve the students in the planning to the maximum degree possible?
6. Did I plan activities effectively to include each child to the best of his ability?
7. Did I program activities so as to individualize instruction?
8. Did I use the most effective means of correlating the subject matter?

B. OBSERVATIONS OF THE CHILD

1. Observe the flexibility of individual role interaction within the group.
2. Observe the child's use of communication skills both as an individual and as part of the group.
3. Observe for evidence of individual research and task completion.
4. Look for evidence of social interaction skills -- does the child share materials, task turns, accept responsibility willingly and communicate well with his peers?
5. Observe for any evidence of change in attitude toward school-related activities. Look for any changes in attitude toward the world of work.
6. Observe for evidence of strengthening of individual self-images.

C. WRITTEN EVALUATION (PRE-POST TEST)

1. Name ten (10) jobs you can think of in the building construction industry and describe the duties of each one.
2. Which job interests you most, and why do you think you would like this job?
3. List three (3) ways mathematics is used in the building construction business.
4. What is meant by drawing something to scale?
5. Would you like to work indoors or work at a job outside?
6. Would you most enjoy being a manager of a building construction project or would you prefer to be doing some part of the construction?
7. Do you think you would like being a secretary for a building construction business? Name three (3) requirements for becoming a secretary.
8. Why is insulation used in building construction?
9. List three (3) kinds of materials commonly used in construction of buildings.

10. Does weather have any effect on the building construction industry? How?
11. Are construction workers well paid?
12. Do all building construction workers wear the same kinds of clothing?
13. Describe the jobs of five (5) workers and tell what kinds of clothing would be worn to do this job.
14. To perform the jobs necessary in the building construction industry requires: (Underline one of the choices)
    a. Much skill
    b. Some skill
    c. Little skill
    d. No skill
15. Opportunities in the building industries are: (Underline one of the choices)
    a. Plentiful
    b. Scarce
    c. Non-Existent
16. Write a short paragraph about the worker you think you would like to be if you were to work in the building construction business.

VIII. NOTES TO THE TEACHER

This unit format has been developed as the most convenient method of organizing the materials and activities in order, beginning with objectives and concepts, including motivation and study activities and concluding with evaluation and source material lists. A wide range of materials, facts, ideas, and activities is presented to allow each individual the opportunity to structure his unit to fit the needs of a particular class. Selecting and combining activities, adjusting the scope of the unit, supplementing materials to meet the needs of his class -- all these are teacher strategies that may be used with this unit format. The six elements of the Career Development approach are included in this guide, but it is the individual teacher's ordering of them that makes his class unit unique.

IX. RESOURCE MATERIALS

A. TEACHER AIDS

1. Films
    a. "Building a House"
    b. "Careers in the Building Trades"
    c. "Homes Around the World"
    d. "Machines That Move the Earth"
    e. "Making a Model House"
    f. "The New House: Where It Comes From"

CATALOG OF CLASSROOM TEACHING FILMS FOR GEORGIA SCHOOLS, 1968 - 1971.

2. Filmstrips
    a. "Building Construction" (Coronet)
    b. "Building a House" (Encyclopedia Britannica)

X. BIBLIOGRAPHY

A. CHILDREN'S SELECTIONS

1. Adler, Irving and Ruth; Houses, J. Day Publishing Company, 1964.
2. Adler, Irving and Ruth; The Story of a Nail, J. Day Publishing Company, 1961.
3. Barry, Donald; The How and Why Book of Building, Grosset and Dunlap, 1964.
4. Beneson, Lawrence; How a House is Built, New York: Criterion Books, 1964.
5. Bolian; I Know a House Builder, Putnam Publishing.
6. Colby, Jean; Tear Down to Build Up, Hastings, 1960.
7. Goodspeed; Let's Go to Watch a Building Go Up, Putnam Publishing, 1956.
8. Greene, Carla; I want to Be a Carpenter, Children's Press.
9. Hillger and Huey; Architecture.
10. Kahn, E.; A Building Goes Up, Simon and Schvester, 1970.
11. Leavitt, Jerome; Carpentery for Children, Sterling Press, 1959.
12. Leavitt, Jerome; True Book of Tools for Building, Children's Press, 1955.
13. Meinhardt, Carl; So You Want To Be An Architect, Harper, 1969.
14. Notkin; How and Why Wonder Book of Electricity.
15. Pope; Let's Build a House, Taylor Publishing, 1970.
16. Sharp; Simple Machines and How They Work.
17. Shay, A.; What Happens When You Build a House, Reilly and Lee, 1970.
18. Sullivan, George, The New World of Construction Engineering, Dodd, Mead and Co., 1968.
19. Weisenthal, Eleanor and Ted; Let's Find Out About Tools, Franklin Watts, 1969.

B. TEACHER SELECTIONS

1. Adams, Charles and Samaria Kimball; Job Facts, Reading: Addison-Wesley Publishing Company, 1966.
2. Kasper, Sydney; Careers in the Building Trades, New York: Henry Walck, Incorporated, 1964.
3. Lux, Donald and Willis Ray; The World of Construction, Bloomington, McKnight, and McKnight, 1970.

C. SUPPLEMENTARY MATERIAL SOURCES

1. American Federation of Labor and Congress of Industrial Organizations, Building and Construction Trades Department, 815 16th Street, N.W., Washington, D.C. 20006.
2. American Institute for Design and Drafting, 18465 James Couzens, Detroit, Michigan 48235.
3. Associated General Contractors of America, Inc., 1957 E. Street, N.W., Washington, D.C. 20006.
4. National Association of Home Builders, 1625 L. Street, N.W., Washington, D.C. 20036.

D. ADDITIONAL SOURCES OF MATERIALS

1. Construction Workers (various titles) NVGA CURRENT CAREER INFORMATION CATALOG, American Personnel and Guidance Association, 1607 New Hampshire Avenue, N. W., Washington, D.C. 20009.

ADDITIONAL SOURCES

D.O.T.
O.O.H.
SRA Occupational Briefs

APPENDIX A

TEACHING STRATEGY – CABIN PROJECT

1. Class divided themselves into three (3) groups to represent three (3) competitive building construction companies.
2. Personnel chosen necessary for company operation; also a name was chosen for each company.
3. Project based on building a small lakeside cabin.
4. Much material (plan books, magazines and blueprints) was brought in by students.
5. Plans were studied and students chose one to work with. They chose a floor plan and talked about the factors affecting the choice.
6. Material catalogs were studied, telephone calls made and interviews with building construction persons done out of class.
7. Using figures compiled from research, groups computed their bids.
8. After much enthusiastic group consultation and computation, the bid for construction was awarded the lowest bidder.

APPENDIX B

TEACHING STRATEGY – HORIZONTAL BAR*

1. Class decided on project of making the horizontal bars for the playground. Members divided themselves into groups or committees.
2. Groups or committees formed to investigate the construction of the horizontal bars. One committee consulted the principal to determine the best size, another identified needed materials and equipment.
3. One group worked to determine the height of the bar/bars. To obtain figures, students selected the shortest and tallest child in each grade, measured then and averaged their heights. With these figures, the students determined that two (2) bars were necessary.
4. Students consulted construction representatives to gain information about materials and methods of placing the bars. (Height, depth in ground, etc.)
5. After site was selected, youngsters on the excavation committee dug the holes for the bars themselves, using a post hole digger or shovels.
6. Youngsters on another committee obtained and mixed the concrete or sakrete needed to fill the holes.
7. With the help of a plumber, another group threaded the pipes, placed them in the holes, supporting them with wooden braces to hold them steady while the concrete dried. They used a level with a vertical and horizontal hold to check the level and perpendicularity of the horizontal bars.
8. Some youngsters made signs and posters warning other students to stay away from the horizontal bars until they were ready.
9. When bars were completed, students presented them to the school for playground use.

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* Mrs. Bonnie Bell -- Blackwell Elementary School